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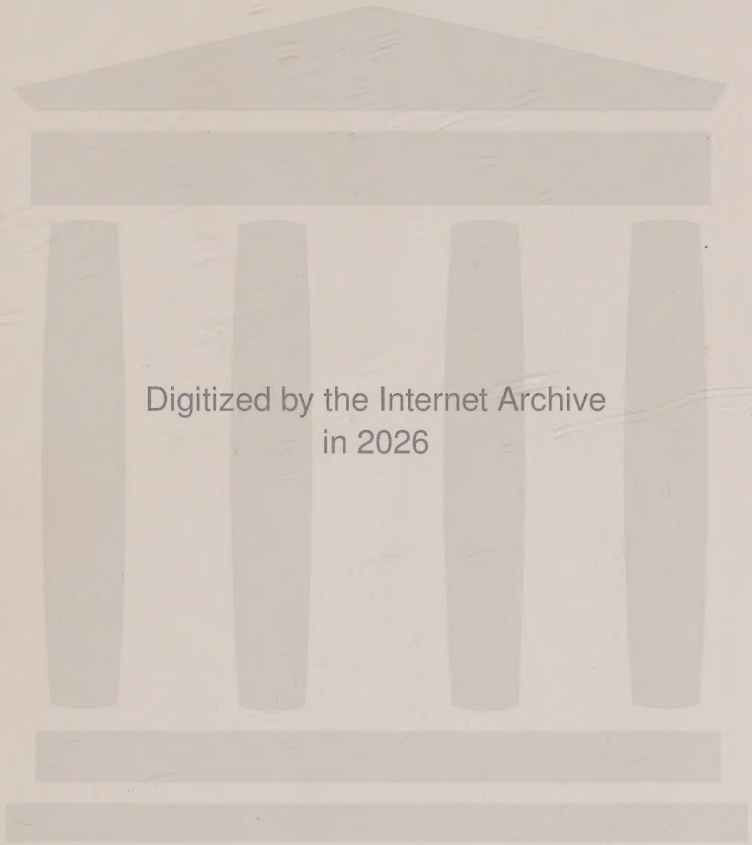
STUDIES IN
PHILOSOPHY AND PSYCHOLOGY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C. E. Farmer

STUDIES IN PHILOSOPHY AND PSYCHOLOGY

BY

FORMER STUDENTS OF

CHARLES EDWARD GARMAN

IN COMMEMORATION OF TWENTY-FIVE YEARS
OF SERVICE AS TEACHER OF PHILOSOPHY
IN AMHERST COLLEGE

BOSTON AND NEW YORK
HOUGHTON, MIFFLIN AND COMPANY
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1906

EDITORS

JAMES HAYDEN TUFTS
EDMUND BURKE DELABARRE
FRANK CHAPMAN SHARP
ARTHUR HENRY PIERCE
FREDERICK J. E. WOODBRIDGE

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TO

CHARLES EDWARD GARMAN

TEACHER AND FRIEND, THESE PAPERS ARE
DEDICATED AS AN EXPRESSION OF THE
GRATITUDE, ADMIRATION, AND
AFFECTION OF HIS
STUDENTS

C. E. Garner

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undergraduate is an uncertain quantity, and methods which secure a phenomenal success with one class meet with much resistance from others.

First, a word as to my methods of work. There seems to be an unavoidable resistance to new ideas on the part of students at this age, a resistance that during the last few years has increased. I have gradually settled down to the conviction that an introductory course ought to be so arranged as to meet this resistance most advantageously. This I have secured by two devices: first, the pamphlet system, which I think is as much of an invention as printing by movable type. These pamphlets I have printed at my own expense; they are very fragmentary, taking up a single topic or part of a topic and treating it as one would in a lecture; these I loan to the students, and they return them for the use of the next class. In this way I can state a question without answering it by having them turn over to the next chapter of the book and find the answer given there. If I find the question is really appreciated, the effort is a success; if not, I must approach it from some other direction, by some other pamphlet which shall have enough new material to hold their thought and stimulate their inquiry, and yet at the same time focus their attention on the problem they have failed to appreciate. In this way I can keep the class at work and keep them moving, prevent their being taken up with outside occupations and amusements, and at the same time be reviewing more thoroughly work they have partially done. It requires as much skill to keep a class together in the introductory course, to give enough work for the best students and not too much for the less able, as it does for the police to handle a large crowd at the time of a public celebration. I can do it with pamphlets, I cannot do it without. If I

read lectures before the class to any extent they become spectators, but by means of the pamphlets they get the lecture before coming into the class-room, and our time is spent in discussion.

My second device is the order in which our subjects are taken up. Years ago when I taught geometry I found that the students would oftentimes make it a mere intellectual puzzle or mental gymnastics, but that by applying some of the problems to questions in surveying, in astronomy, and physics, I could bring the men to realize that in studying geometry they were gaining citizenship in the universe, and they were at once led to interpret their lives as far as possible in terms of these propositions. In taking up philosophy I have attempted to do something of that same kind of work; I present the fundamental positions from the point of view of the history of the discussions in psychology, in philosophy, and ethics, and to some extent of those in political obligations. It makes the matter as serious and personal as possible, and as a result it has often cost the students a very great effort to satisfy themselves instead of simply meeting the requirements of the recitation-room.

Now in answer to your particular questions I can only give very general impressions.

"1. Why is this (readjusting of their views) necessary, *i. e.* what is it meant to accomplish?" — The earlier life of the students has been one of imitation and obedience to authority; it corresponds to traditionalism in tribal or national existence. The great requisite for a young person is to form habits. I have sometimes been asked to give lectures to the lower classmen on methods of work, and I think it would be very proper to do so, but I have more and more realized that students acquire right methods of work not through explanation but

through imitation and discipline. I have had students completely carried away by my lectures on methods of work in the fall term, and declare that "if they had only known that freshman year it would have made such a difference with them," and yet in three months' time the entire effect had passed away, and they would do only what I forced them to do by actual drill. I am confident, therefore, that the earlier education of the student must be wholly by imitation, which should be more or less blind. But there comes a time when the young man must assume responsibility for what he does; there must be self-possession and self-direction instead of dependence on authority, and this is a new experience to him, an experience which many shrink from even in very little things.

Those who decline to follow this unfolding of their nature, and there are very many of them, begin to fossilize. If they are religious they soon become Pharisaical, get lost in particulars, are unable to discriminate the essential from the accidental, and take refuge in doing something, and their religious activity is oftentimes such as exhibits zeal, but without knowledge. If they are not religious they become fastidious in imitating social customs, and very soon develop a degree of indifference toward everything except mere form; they become heartless, selfish, many cynical. There is no hope for a young man at this time if he does not meet the obligations of life with the spirit of self-reliance, but to do this he must have some confidence in his own judgment and the standards by which he judges. This is the spirit of philosophy.

A young man who does not have the spirit of philosophy grows up a woman minus her virtues; he can never have the intuitive power of a woman, but he is sure to have her sensitiveness, her vanity, her fickleness, and generally he will greatly exaggerate these qualities.

It is my conviction that a young man can obtain inspiration, enthusiasm, absence of self-consciousness only by the steady contemplation of great truths; that if he is wholly absorbed in imitation he is like a person whose whole work is that of a proofreader; if he is successful, he is taken as a matter of course, and he gets no credit; if he is unsuccessful and makes mistakes, he is awkward; he is ridiculed beyond endurance; he soon realizes that the most promising rewards for the most careful efforts are negative, and he soon becomes indifferent, and is simply goaded on from fear of the consequences of failure. But the young man who philosophizes, who really understands himself and appreciates the truth, is no longer a slave of form, but is filled with admiration that is genuine and lasting.

This, I believe, is exactly the issue which is settled at this critical period of a young man's life. But the question arises, why should philosophy, psychology, and ethics be the studies which most favor self-reliance, rather than mathematics or the sciences?

I have often raised the question as to whether I would not let down my course and take a little rest and devote myself to publishing, but I have found that somehow students' minds would be satisfied with nothing less than these most difficult problems. I did not awaken enthusiasm or gratitude until these were mastered, and so I have come to the conclusion that there is something in these subjects which the mind demands at this stage of the young man's development.

It seems to me that mathematics fails to meet the demand for two reasons: first, there is no difference of opinion on all these subjects, and the student does not really have to stand on his own feet; thus it may become more a discipline in ingenuity than in decision and self-

reliance. Secondly, he oftentimes knows pretty nearly what the answer will be, and therefore gets very decided hints as to the means; that is, he really has some guidance either from text-books or from experience; he is not a Columbus sailing over unknown seas with everything before him untried.

With regard to the physical sciences, there is some difference of opinion here, but his main time is spent in undergraduate work on matters that are generally accepted; he has more or less assistance about the use of the apparatus, and his main consciousness of need is of ingenuity and of quickness; and then the enormous admiration which our age has for the discoveries of physical science gives him almost a superstitious reverence for anything that can be called scientific. I mean by this that he accepts a great many positions in science without really testing them, and thus he almost gets back into the imitative work again; but when he comes to philosophy it is a new world. The trend of public opinion, especially of society life, with which he is most familiar, is not in that direction; it requires something like the heroism which was demanded of Luther and of the anti-slavery leaders for him to attempt the positions which even in an undergraduate study are forced upon his attention, and he cannot follow authority, there is so much difference of opinion. He is obliged, therefore, to weigh evidence and to let himself down with all his weight upon his own feet. It takes me six months to bring even the better men in the class up to a place where they will really weigh evidence; when their attention is called to it, the issue is forced and they are greatly surprised to find the extent to which they have blindly followed authority, — they are almost as frightened as some horses are when the blinders are taken off. But when the idea fairly dawns upon them

that true scholarship consists, not in some mystical quality of genius which ordinary men do not possess, but in simple honesty to one's self in following out the Cartesian Golden Rule, then they experience a new birth, they are no longer boys or slaves, but men. If they attain citizenship in the kingdom of truth, they perceive that the difference between the greatest and the smallest consists only in the quickness and comprehensiveness and thoroughness and humility of their work. Truth to one man is truth to all if they can get exactly the same data and exactly the same standards. Henceforth they call no man master or lord, for all are brethren.

No doubt a similar development could be secured, if we could only have the right circumstances, by business responsibility, or by military service, or by actual professional practice and training, but I think it would be pretty costly, and that the usual percentage of failures would be maintained. Philosophy has this advantage, that it gives the training under such circumstances that the best results can be secured with the least danger.

"2. How should it be guided, directed, or controlled by the instructor, *i. e.* what topics first and last, should it be deep going or drastic? are there dangers, and if so, how avoided?" — The first requisite is success. Power reveals itself only in work done; if the student gets confused and discouraged he is worse off than if he had not attempted to decide for himself.

It is my conviction that the introductory course should always be given by a teacher of the largest experience and greatest power of adaptation. I feel that when the student has learned to stand on his own feet and to weigh evidence thoroughly, and to avoid jumping at conclusions because they appear plausible, he can be left to the guidance of the less experienced teacher, but that first ac-

quaintance with philosophy is the grand opportunity, just like the breaking of a colt; carelessness here will vaccinate against future success.

The student needs to be taught first constructive thinking. He has been accustomed to a certain amount of analysis; all this, with rare exceptions, is clerical work. He will make a very good table of contents or the outline of a certain argument, but he takes the author's own estimate of each step of his position, and has no power to understand independent valuation. The first thing is to teach him that scholarship demands constructive criticism, and here we must begin with the easier subjects. In my own experience hypnotism is peculiarly favorable for this kind of work. I give them several recitations on the details of hypnotism up through double consciousness in Binet, etc., then I ask them to give me, not an outline, or table of contents, but such an argument as a judge would give when reviewing the case before a jury, telling them not to go into details, and not to jump at conclusions, and to give the extremes under each type. The papers I get back are a sight to behold. These I criticise, writing in corrections with red ink, and hand back, and then require them to try again. By this time they discover their mistake, but do not see how to remedy it, and then comes a great deal of very frank talk. Then they realize for the first time how much they are guided by authority and imitation and indeed begin to wonder if there is anything else in scholarship. Then I give them in very brief form my own argument, and then follows a most interesting series of comments which generally agree in this particular, "How could we be expected to have discovered anything like that in the reference-books?" and it very soon becomes formulated into the idea that the standards for undergraduate thinking ought not to be the same as that

which is demanded of the teacher. In other words, there is a difference of kind between the teacher and the taught.

I believe the great secret is to take some one subject and make a success of that rather than to go from subject to subject. Hence, I work over this particular problem until the men come to see clearly that it is simply an unfolding process, and that they could have worked it out if they had only weighed evidence. We then take up a series of subjects in psychology, and show their ethical and practical significance, and also the places which they have occupied in historical discussion. Each subject has a twofold significance. First, it is not so difficult but that the students can in time realize just what constructive work here means. Secondly, each subject points in a particular direction ; namely, towards the unity of our mental life, the fact that our practical activity is founded on our mental constitution ; and the students are brought to realize that simple things are more complex than they seem, and therefore more thorough study will be demanded, purely from practical considerations, if one has no higher motive. I feel that the work should be thorough or not touched at all. Some subjects may be merely referred to, but it is better to take one subject and do it thoroughly, and show the students what it involves, and the true methods, than to give the results of investigation without giving the processes.

Just here I have to fight strenuously against the students using the class-room as a pony ; when a problem is given out and the data presented in the class-room, they must attempt a solution for themselves, and not wait and get the results presented in the class-room. Hence, I require frequent papers written on topics by the whole class before the discussion is completed in the recitation. By means of the pamphlets I am able to do this, but if the

pamphlets were bound up in a volume the students would look over into the next chapter and save themselves trouble. The dangers that are most serious, in my judgment, are demoralization and discouragement, such as may come over an army in a panic. Students are very quick to suspect a sleight-at-hand performance on the part of the teacher, and that some other author could get just the opposite results, and instead of weighing evidence they fall back on ingenuity and sophistry. I believe every student has to go through a period of sophistry if he fairly faces this work, and I believe in having this fit of measles early and having it out of the way ; but for some little time the teacher has got to be on the lookout for the sequelæ, and he must not trust too implicitly to students when they say they are through with them. They are quite likely to enjoy the position of uncertainty, and use it to justify themselves if they have any immoral tendencies. But if you can get the man so far along as to make him have confidence in the power of weighing evidence, to realize how much civilization owes to it, how every department of life can be progressive only through scientific thinking, and then make it a moral question, and show that intellectual honesty and supreme choice of truth for truth's sake, and determination to follow evidence to the best of one's ability, is the great line of cleavage between the saints and the sinners, — if you can force the issue here and win, then the class are entirely different afterwards. I do not believe without this moral battle, without considering the ethical phases of the question, it would be possible to get the best intellectual results.

3. " What would be one or two good literary treatments of this question of epistemology ; *i. e.* is a course in Locke, Berkeley, and Hume the best to begin with, and is Kant a final solution ? "

Having taken them through a discussion of some of the simpler questions in psychology, our work centres around the doctrine of association and habit as it is presented by James, and the men are made to realize how much of our life has a physical basis, especially by the study of pathological cases. We now face the problem, Is it all dependent on brain action? If so, what would be the consequences? Up to this point they have had the point of view of physics and the natural sciences. Epistemological work is fairly before us when we take up Berkeley. I should prefer Berkeley and the Sophists taken up together. The great thing is to force upon a young man's mind a problem in all its seriousness. I do not feel that Locke is an economy of time for an introductory course unless some of the men hold to innate ideas. Therefore we begin with Berkeley, then take Hume with John Stuart Mill's additions, then selections from Spencer until we get before the student the problem of our standards of thought, whether these might not be wholly relative or due to association, and show what would be the effect on ethics and religion. Then we take up the study of reflex action, the automaton theory, and psychological problems. This brings the matter home to the students, till it seems as though physical habit (heredity and associations of ideas) would account for our most sacred convictions. The reason why I make this so strong is because at present there are very many outside enterprises distracting the students' attention. Unless philosophy is a life-and-death matter you will not get the thorough work, the hard work, which the students really need to do. They soon get a faith in the teacher, and think that a man who is able to present so clearly the argument on a few points which they have had will be able to guide them on all the difficult ones, and that somehow they will come out

right anyway. So when they get into the larger questions and do not see the bearing of some of the problems, they are in danger of making drudgery out of it instead of philosophy, and so lose their inspiration.

Our next step is to bring before them the questions, Can the brain weigh evidence? Can the brain give us personal identity? Can the brain give us memory in the true sense of the word? Can we account for the existence of error if we have only brain action? Here we take up such discussions as are given in Clifford and James's "mind stuff," and review Herbert Spencer until the men clearly realize the position which Wundt brings out, that there must be such a thing as psychical causality. This comes to them like a revelation. We are then ready for Kant and at the same time for the study of particular questions in physiological psychology. Then the men see what the fusion of sense perceptions means, also what problems are at issue in space perception, for instance, or in time perceptions, and most of all in attention and volition. It does not seem to me that the main problems of experimental psychology should come at the beginning of the course; they surely get a double meaning when taken up at this stage.

4. "Is it possible to find the way out of agnosticism or could an ingenuous soul be left to wrestle with it?"

My feeling is if the best students have the right method of work and have the spirit of investigation, agnosticism would in time work itself out if left unsolved, but that the average student needs help, at least to this extent, to show him that he cannot make any hypothesis which will be a reasonable basis for his knowledge of the physical world and of natural science that does not involve as its basis something more than the physical world. I believe the place to take this up is with Kant's "Practical Reason,"

and if this is fully appreciated the students will find no great difficulty in theism, at least as the only hypothesis which gives any basis for science and human life. It is so easy for them to feel that our knowledge of the material world is simple, and our knowledge of moral obligation and of spiritual life a mere matter of opinion that I cannot content myself with leaving the class until they realize just the reverse. It is not very hard to make the students understand that our standards of thinking are spiritual, and that unless we can use these standards in judging others, and in interpreting nature, and in interpreting human life and human destiny we are guilty of the worst form of anthropomorphism, an anthropomorphism for which there is not the slightest justification. But with the application of these standards moral obligations are authoritative and society cannot dispense with them. The class derive great inspiration from this point of view. It converts them from disciples to apostles, and it helps them in every position of graduate work, in law, in literature, in theology, and in medicine. The business world is the severest trial, and yet nowhere do they need this point of view so much as when they are tempted to sacrifice everything to mere accumulation of wealth.

The great need of our students from a practical point of view is an ideal; the great danger is that they will become visionary. Hence I cannot let them go until I hold out before them the ideals of a spiritual life, and then make such a practical application as will enable them to understand the evolution of religion, that is, how it was possible for a divine being to tolerate slavery, polygamy, etc., provided these are wrong. I show them that an ideal is like the north star which the colored slave would follow, not with the expectation of ever reaching the star, but under the hope that by following it he might

better his condition. I bring in the laws of the unfolding of the life of the individual and of the community, until the men discover that the great question of human history is not so much "where we are as whither we are drifting," and that time is required for all progress. Without this discussion the men would at first be idealists and visionary and then get discouraged and wonder whether their college course had not been too optimistic, and whether finite human beings are not powerless to hasten the evolution of the race. This will lead to hope and lessen their indifference as citizens.

I fear that I have wearied you by my long letter. I do feel that the teaching of philosophy is an opportunity which no other study offers. I feel that the student who has been through these doubts and worked them out for himself has learned the strength and at the same time the limitations of the finite, and that he will have a degree of courage and patience in adversity, a degree of self-reliance and humility which others can secure only by those peculiar experiences which occasionally occur in actual business or politics or the professional life. The student who has taken philosophy realizes how the part is to be estimated in the light of the whole, he realizes this more completely than he could from any other study. He also realizes the dignity which a part may secure from the grandeur of the whole to which it belongs, and the little things in life have a depth of meaning for him which they could not have if he had not this point of view. There are considerably many who, in spite of all the teacher can do, use the class-room as a pony, who therefore get only some of the benefits of the course, but it shows in all their other work. The habits that are formed in college are so persistent that the student does not readily change them after he goes out.

Hoping that I have not tired you by my long account, and that I have not given too much emphasis to the personal equation, I am

Most sincerely yours,

CHARLES E. GARMAN.

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STUDIES IN PHILOSOPHY

1

ON MORAL EVOLUTION

James Hayden Tufts

I. INTRODUCTORY

The advances in general and genetic psychology on the one hand, and in social psychology on the other, give the point of view for attempting an outline of the development of the moral self. The more important results from these disciplines, as regards the explanation of the moral life, are the following: —

1. The conception of mental development as a process that starts with certain instincts and impulses which have biological explanations. The rise to active, intelligent personality takes place largely on occasion of reactions with environment, in which the simple discharge of impulse is blocked, and the longer way of thinking and planning is forced if the being or the race is to survive. Gradually ideas, which at the outset were evoked by impulse and environment, assert more power, until they create in large measure the environment, and remake the impulses.

2. The recognition that the self is many as well as one. It is many before it is one. It is long before its acts are connected by habit and memory into one morally responsible agent; it is longer before its many interests and impulses — egoistic and generous — are all brought into one spiritual unity.

3. The conception of the self as always a *socius*. As the coming to consciousness of the self implies a world to

struggle with, so it also implies other persons, other selves. As in law the conception of a person implies the idea of rights, and rights imply a relation to other persons, so an ego cannot exist in a vacuum. He can say "my" only as over against a "your," and "I" only as he contrasts or implies a "you" or a "they." Man is always a member of some social group. The primitive man, the little child, is relatively not detached from his group as an independent individual. Only gradually does the individual conceive and organize his own separate interests. Unconscious solidarity is the status at the outset; conscious individuality and conscious social interests are the final outcome.

To these three concepts — of the mental life as a growth from impulse, of the complexity of content, and of the social character of the self — we may add one general principle of method. It must be kept in mind that what is true of mental process in general is preëminently important in the moral life: the process of development and growth is always synthetic in the sense that a given stage is never simply the sum of past factors and agencies. The conception of the self as moral involves the constant process of a dynamic unfolding and reconstructing agency, which pushes on to higher levels and judges or evaluates the past.

After a brief preliminary statement of (1) the chief factors in the developed moral self — the goal of the process, and (2) the genetic elements which are postulated as the beginning of the process, I shall discuss under II the causal agencies in moral evolution, and under III outline certain important phases of the process.

1. The Chief Factors in the Moral Self

When we speak of a moral man we imply, broadly, both that he has character and that he has a certain kind of

character. Moralists distinguish the same aspect as a form and a content. Aristotle speaks of a "how" and a "what."[1] Broadly speaking, this has its basis in the twofold aspect of mental life. On the one hand it is a process of subjective control, purpose, feeling, and habit. On the other, it is an adjustment to an environment physical and social, a mastery of environment, a development of capacity by the actual struggle with objective conditions, and by the actual performance of function in a social organism. Psychologically the phrases attitude and content bring out much the same.

On the side of the "how" the important aspects are:

(*a*) The setting up and recognition of some standard, which may arise either as a control in the guise of "right" and "law," or as measure of value in the form of an ideal to be followed or a good to be approved.

(*b*) Purity and sincerity of motive, whole-hearted interest in the end.

(*c*) Organization of impulse and ideals into responsible character.

On the side of the "what," there are two aspects:

(*a*) The development and refinement or idealization of powers, giving advance in knowledge, in art, and in the consciousness of rights.

(*b*) Regard for others under its various aspects of justice, sympathy, and benevolence.

2. The Genetic Elements

What we postulate as the elements of the moral process will evidently depend somewhat on where we assume the process to begin. It is in some sense arbitrary where we make our first cross-section; for it is evident that any conscious control of action is in the line of preparation, at

[1] *Ethics*, bk. ii, ch. 4, § 3.

least, for moral action. Nevertheless, on the psychological side, we have a natural starting-point in the instincts. The instincts, accompanied in some cases by emotions, are of biological ancestry. They are selected in the struggle for existence because they are modes of action favorable to the organism or to the species or the group. They are not themselves psychical products. They form the beginnings, and later, rationalized and idealized, they remain the driving forces of the process. It is from the instincts making for the advantage of the individual that the self of material interests, of personal ambitions, of assertive rights, is gradually organized. It is from the instincts selected by the welfare of the group that the self of justice, sympathy, and love is brought to conscious life. Intelligence brings wider range of experience to bear upon the present; in feeling the self values its experience, and thus may find new motives to action; but as it is will which forms the centre of interest for morality, so it is the instinctive, impulsive tendencies which form the point of departure.

On the objective side we take for our starting-point man in group life. We find him here engaged in the various occupations — seeking food and shelter, making tools, fighting, wooing, caring for children, defending his group, seeking companionship and help, seen and unseen — which correspond to the various instincts. Here are present for the first time all the elements which give the possibility of full moral development.

II. CAUSAL AGENCIES IN MORAL EVOLUTION

The moral consciousness and character of a man or a generation may be attributed broadly to three sources: (1) Nature, or physical constitution; (2) Society or social heredity; (3) Original achievement, or the formation of

character in dealing with the problems and situations of physical and social environment.

(1) Under "nature" we may distinguish the conservative factor of heredity, which would tend to continue the race at about the same level, and the factors making for progress. Progress through biological agencies is probably limited to what James calls the "back-door method" — accidental variation, although a given variation may be preserved by either natural or social selection; the wise may be both better able to cope with nature and also given special care by his group.

Acquired morality is probably not transmitted by physical heredity. It can only give the physical factors a better chance, by supplying conditions favorable for the emergence and preservation of desirable variations in offspring, or in general for the young of the group.

But acquired morality may be and is transmitted by (2) social heredity, by which we mean the transmission from generation to generation of certain standards, ideals, and implications of authority embodied in tradition, custom, language, and institutions. The new generation or individual learns these in a way sufficiently distinct from the independent formation of standards and character to make a distinct treatment desirable.

(3) Deliberate, conscious choice and action is undoubtedly the basis of full moral consciousness and character. Nevertheless it is relatively a small factor in the early stages of moral evolution, and in the development of the child up to the adolescent period.

When we ask how much moral progress is due to each of the three agencies named, we are largely in the air. No one doubts that reaction to a peculiar condition in politics and society develops a Socrates or a Lincoln; that a religious conflict gives deeper meaning to the moral life of a Paul;

that abuses rouse a Voltaire or a Bentham to criticism and reform. But no one can tell just how much was due to their physical heredity. Why did the situations provoke them to action and not others? Was it because of birth or of training? In the case of a man who opposes current ideals it might seem that it could not be training. But even here a conscientious attitude may be cultivated which may later turn upon the contents of its teachers' morality.

Again, is there any real advance which so registers itself in the physical organism as to be hereditary? No doubt the modern European or American child has greater capacities than the pithecanthropos, but it would be bold to affirm that the infant of to-day is notably superior in moral traits and capacities to the infant of our ancestors of two thousand years ago, or that the Jew of the Christian era was naturally superior to the Jew of the day of Nathan the prophet. It is seemingly impossible to devise any accurate way of measuring an assumed advance in the hereditary basis. The test cannot be applied to the child at birth, or even in early childhood, for several of the instincts and factors in the moral self cannot be looked for until at least the adolescent period. But by this time the second and third agencies — society and the child's own reflective action in the presence of problems — have been at work, and it is impossible to separate their respective contributions.

But while individual tests may be difficult or impossible, we may attempt some general inferences as to the *operation of natural and social selection* upon variations. We undoubtedly have certain individuals varying in the line of greater intellectual activity, stronger instinct for mastery and gain, greater sensitiveness to ideal beauty, greater parental or social sympathy. It is obvious that natural selection will favor certain of these variations, which help

the individual in the struggle for existence; that the struggle between groups will likewise favor those groups with social instincts, whose mutual aid makes them strong. Social selection will reinforce natural selection in many cases. It might seem then that the cosmic process is in the service of the moral. But a serious obstacle to progress along this line presents itself in the apparent collision between the two sets of instincts. Idealization and individuality seem fatal, if not to parental affection, at least to that regardlessness in the exercise of sex and parental instinct which results in a large number of offspring. If not an absolute "race-suicide," there is undoubtedly a relative failure to increase among individuals intellectually, artistically, or economically exceptional.

Is it true that moral progress is handicapped by breeding from the "lower" strata? Perhaps the case is not so bad as it appears. The kind of ability which results in economic success is often connected with a certain hardness of temper. Even intellectual acuteness may mean an abstraction from family or political interests which is useful for science, but on a large scale would be injurious to public welfare. If the well-to-do and the intellectual are too selfish or too abstract in interest or too anæmic to want children, it is better for the race that they should not have them. Individuality and ideality are desirable, but to propagate them at the expense of the parental and social instincts would be to pay too high a price. The greatest single factor — not by any means the only factor, as Sutherland would make it[1] — in the development of the social and emotional aspects of morality is the natural selection of stocks which show increasing care for offspring. The statistics show impressively that the birth-rate in the animal world is of almost trivial importance in

[1] *The Origin and Growth of the Moral Instinct.*

comparison with the elements of intelligence and care.[1] Professor Willcox's paper in this volume shows analogous results for human increase. But when it comes to a choice between the individualizing and refining process, on the one hand, and the sex, parental, and social instincts on the other, nature will not hesitate. And in the interests of moral progress is not nature's choice the wise one? Is it not easier — if the alternative is thus set — for society by its agencies to cultivate the individual's development mentally than to cultivate the generous and sympathetic disposition?

It would seem, then, that as regards the factor of natural selection, we can trust nature to keep up the level of strength in the sex and parental, and perhaps also in the sympathetic instincts, and to maintain so much of the intellectual progress and self-assertion as does not interfere with these.

The significance and method of the social agency need further analysis. How does society communicate its moral content to successive generations, or to put it from the standpoint of the learner, how does a generation or a child assimilate the culture and morality of society? He learns both consciously and unconsciously.

Moral *content*, the "what," is taught by society with full consciousness. So far as this is an idea or intellectual material it can be and is taught like other information. Just because the "how," or moral attitude, is not information or knowledge, but a habit, a valuing, a disposition, the problem is more difficult. So far as the attitude consists in the careful weighing and measuring of seeming standards and values, *i. e.* in so far as all virtue can be reduced to wisdom, Plato faced the issue squarely. For

[1] Given in Sutherland, vol. i.

this there must be not only the emotional culture of the sentiments through music, art, and literature, but also a training in analysis and reasoning. These are to give the reason skill as an instrument, and power as a mental constituent, so that it may be able to assert its own needs as best and most satisfying. Here we are of course on the border line between education by society and education by self.

But does society have any direct influence on the "moral sentiments"? Does it help in making ideas of right into ideals for action? in giving authority to the right? in fostering sympathy, justice, and benevolence?

Three answers have been given, which need to be supplemented in certain details by a fourth.

(1) *The Association Theory* of social influence. This may take two forms.

(*a*) Direct association of values with words and ideas. Parents and society utter certain words of approval or condemnation with tones which carry pleasant or unpleasant associations. The child may not have the slightest intellectual conception of "horrid," "nasty," "disgusting," "mean," "wicked," "good," "fine," but he senses a decided emotional value as these are pronounced by an earnest parent. Nor does the social influence stop with infancy. Society uses certain epithets, such as "vulgar," "heretic," "anarchist," in a purely emotional sense and exercises considerable pressure thereby. This sort of direct association is combined in Mandeville's theory with appeals to pride, but the essential character of it is the direct association of value with certain moral terms.

(*b*) The association of pleasant or painful *consequences* with certain acts. This as developed by Bain and Spencer has been so often criticised that it need not be analyzed here. It is unquestionable that society and parents must

sometimes use such associations to check the thoughtless or lawless, but the associations of this class, as of (*a*), will sooner or later seem artificial if they conflict with powerful interests. Duties based on them will appear mere "conventions." We therefore are forced to inquire whether society has any mode of teaching the intrinsic as *versus* the external obligation and respect for authority.

(2) *The Sympathy Theory.* This has two applications. Plato holds that emotional influences in childhood, rhythm and harmony, Apollo and the Muses, begin the education of the young and teach them, without conscious purpose on their part, to find pleasure and pain in the right objects. There is no doubt of the importance of this in race heredity. The agencies of art, music, and literature have been widely and effectively used to inculcate values, and give power to ideals honored by the older generation.

The second application is to the specific case of valuing the interests of others. Here belong all such institutions as family, clan, men's houses, clubs, in which a group acts directly on the individual's feelings, accustoming him to feel, not as an individual, but as a member of a group, and therefore as having common interests and common sentiments with others. Further, in judging as well as in valuing, he is on a sympathetic basis, using a common standard of honor. There is no question of the immense importance of this factor. But it does not seem to provide for the duty or "ought" aspect, and hence we have

(3) *The Imitation and Polar-self Theory.* This has been most fully developed by Baldwin. The valuation of action from a social standpoint is based on the social nature of the self; but as contrasted with the previous view, this social nature is given a basis on the knowing side of our nature, rather than on the feeling side. The self, it is held, is formed largely by imitating the persons

in its environment. The child copies father, mother, playmate, and therefore *is* for the time being father, mother, playmate. It commands, threatens, sympathizes, feels as its models command, threaten, sympathize, or feel. It in turn practices these attitudes or selves on others, but it is always some *socius*, never an isolated self. It is also a different *socius* according as it is playing the rôle of learner in the presence of father, tyrant when with a younger child, or equal with a fellow playmate. Consequently its interests are as varied as its rôles, and its standards of valuation as broad as its interests.

This theory has an explanation also for the origin of the attitude of duty, the feeling of respect for authority. The child as learner is made conscious of his limitations; he feels that he cannot copy all of his father or teacher or ideal person. He recognizes superiority; yet as the superior person is not exclusively an outsider, but is rather, as *socius*, a part of himself in the largest sense of the term self, the feeling is one of respect, not of fear. It prepares for full autonomy. Here, then, is an answer to the old question, "Can virtue be taught?" which would make the teaching of αἰδῶς, as well as αἰσχύνη, possible, though by example rather than by precept.

How far is this a satisfactory account of the genesis of the social sentiments and of the sense of duty? There is no doubt that it contributes an important factor — more important for the genesis of these sentiments in the child than for their evolution in the race. If we state it in terms of the dual nature of the self set forth above, the theory might run: Granted that the "ought" rests upon a tension between impulse and reason, or impulse and habit, or habit and reason, the child is at first largely impulse, and the two other aspects, viz. habit and reason, are represented in his consciousness by parent or other superior

person. The question that arises as to its adequacy in the case of the child springs from the fact that by it the sense of duty is derived largely from the cognitive process. The parent is wiser; yes, but if this were all, the moral conflict would be less passionate, and authority would less often win. The controlling agency needs reinforcement by all the impulses and emotions which appear on the instinctive basis, or which can be kindled on the sympathetic basis, and needs beside the reinforcement of direct appeal to such impulses as that of receiving public approval, to make it fully effective. And this explains why it is relatively less important in the race evolution. The social-self idea is fundamental. The cognitive aspect of it, the element of mystery in the presence of the unknown, is also present in race evolution, particularly in religious cultus or initiatory ceremonial. But the process of learning is here less a process of imitation, more a process of direct appeal to impulses, or of pressure by the social, as organized in customs and institutions, upon the private self.

On the other hand, it has been questioned whether the imitation theory has any application to the social process. The accounts given by Spencer and Gillen of the deliberations of the old men upon the question of changing or adopting a custom would certainly tend to minimize the influence of this method of social heredity, and to give a much larger share to the moralizing agency of conscious choice. The really important rôle of imitation as compared with conscious volition in the case of adults and even of children would seem to lie less in the adoption of ends than in the adoption of technique. In the case of language, for example, it is an instinctive matter that the child begins to babble sounds; it is a volitional matter that the child comes to control gesture and sound to gain

the ends he desires; but it is a matter of social heredity through imitation that he uses the particular sounds and the particular syntax of English or Chinese. So in customs of moral significance: the mediæval knight and the Japanese Samurai alike desire to maintain honor; the one challenges his insulter, the other commits harakiri. The passion is instinctive, the end is volitional, the method is imitative. Jewish and Greek idealist both seek a better social order. For the Jew it is a kingdom of God, for the Greek a state controlled by wisdom.

The three agencies noticed above do not provide for all the lines of social influence. Neither associations, nor contagious sympathy, nor presentation of "copies" as models for imitation, does justice to all the facts. We need to add

(4) *Social Organization* as directing the discharge and organization of instincts and impulses.

This may be stated both socially and psychologically. Socially it means that the child or primitive adult has various impulses, — to eat, to hunt, to attack, to satisfy the opposite sex, to company with others, to assert control. Society, however, by its very organization makes it necessary for the child to eat with others, to live with a family or clan, to hunt with a group, to satisfy sex impulse under certain limits, to company with certain men, to revenge himself only in certain ways. Or it gives definite scope for what would otherwise remain inchoate; the institution of property develops the instinct to possess; the religious cultus the instinctive reactions toward the unknown; the political or industrial organization the impulse to rivalry and mastery; the festival the impulse to rhythmic expression. So far as the social side of the case is concerned, I regard this as the most important of the agencies for control and for development.

What of the psychological side? How does the individual react to this organization? Is it not by one of the three processes already noted, viz. association, sympathy, or imitation? He learns something by each; but in this case he learns also (*a*) by suggestion and (*b*) by independent observation and adoption. In suggestive learning the individual neither intentionally copies, nor unconsciously plays the rôle of another. He is himself all the time, but he adopts such ideas, habits, or methods as he likes. In (*b*), independent volition, we are already in the field of the third agency of moral growth. But while it is psychologically not a single process, this fourth agency is socially distinct, and as such deserves explicit emphasis.

A brief notice will suffice for the factors in the *third agency*, viz. *the individual's own volition*.

The first and chief factor in this process, stated objectively, is *opposition* in the physical and social environment; stated subjectively, *effort*.[1]

Opposition of the physical environment, including the difficulties of erect stature, prevents immediate gratification of impulse; it thus occasions the comparison of goods, the process of valuing; it throws the individual back upon himself, and provokes reflection; it heightens emotional tension, and through the process of the work necessary to gain the end, organizes character. For as will be pointed out in more detail later, the very nature of work, at first as effort, provoked by immediate necessities and impulses, and later as elicited and diverted by a remoter end set up by thought, is that it implies and strengthens the capácity to *take* an interest, to control impulse by idea, and to con-

[1] Cf. Mezes, *The Essentials of Human Faculty*, University of California Publications, Philosophy, I.

nect a series of acts into a continuous whole, the counterpart of a continuous self.

The fact of physical opposition or resistance to the wants is, further, the objective occasion for social coöperation and mutual aid. That man cannot supply his own wants forces him to seek the coöperation of others. But mutual service, or service for a common end, is the most effective positive agency for promoting social will, as distinct from social sympathy. To make the ends of others one's own, even from motives of physical necessity, is the most valuable method of preparing the way for a social will of a completely voluntary sort.

Finally, the opposition of interests which arises between individuals because of mutually exclusive ends, forces conscious choice between selfish and generous conduct.

Next in importance to opposition is an environment, — a muscular system, wood, clay, stone, metal, fibre, air as a medium for sound, — in which purpose and skill may find objective embodiment. Psychologically stated, ideal volitions must be actualized and carried out if thought is to grow and character to form. Constructive production in all the crafts and fine arts has given power and permanence to the mental, and in so far to the moral life. The consciousness of personality, of agency, may owe its rudiments to the processes of imitation of other personalities, or to suggestion from them. Its deepest root, however, is probably this successful producing of objective results. The self as a creator or maker is a real self.

Nor is the influence of this active construction and expression limited to the formal sides of character. The reflex effect upon the artist or workman himself of handling color and sound, of producing form and rhythm, the social effect of presenting to others ideas and stirring their emotions, the refining and elevating influence of giving

objective embodiment to the ideals of the most gifted, — all this belongs to the moral value of "manual training," of music, of literature, and every art!

III. THE PROCESS OF MORAL EVOLUTION

In this section we bring together the aspects and agencies which have been separated in the preceding analysis. We show the intimate interdependence of form and content; the interaction of physical, social, and volitional agencies.

The general law of progress on the formal side is: The rational, which in full morality is standard, law, and ideal, is at first presented, not by itself, but embodied in persons. Gradually it works free and comes to explicit recognition. Similarly character is organized at first by social pressure, later by self-directed work.

On the content side the law is: Idealization of life is possible only through the processes of control and selection just stated. Here too, therefore, the social embodiment of ideal ends is primary, the more definitely rational valuation of science and art is later. The other phases of content, viz. individuality and sociality, pass through the following process: Society begins with no sharp distinction between self and others, with no definite rights, no personal duties, no positive freedom, no strictly personal responsibility. As rational standards are gradually set up and brought to bear upon the conflicting claims of individuals, or upon the conflicts between individuals and the group, all these positive factors in individuality and social obligation assert their value and gain explicit recognition.

Finally, as the result of this twofold development of form and content, the full moral consciousness is born. This has standard and motive and authority all within

the self; and yet since the moral self is completely rational, completely social, it has a standard and motive and authority which are universal.

Starting with the instincts and impulses bred into the race, we notice first of all as a basis for the future complex consciousness that these impulses, quite apart from any other controlling influences, tend to check, modify, or reinforce each other. For example, the impulse to satisfy hunger is liable to be checked often by parental impulse, while the impulse to resent attack may be greatly reinforced, as in the "bear" robbed of her whelps. Rivalry or emulation is immensely strengthened by sociability with its attendant love of praise. Sex impulse is profoundly modified by parental impulse, as the latter gains in force by the lengthening of infancy, keeping the parents together for a longer time, and tending to supplement the physical sex impulse by feelings of sympathy and common interest. The impulse toward appropriation, which later develops into desire of property, has also influenced the sex relation, and seems to have been an important agency in bringing about permanence and exclusiveness. The "neighbor's wife" is not to be coveted, "nor anything that is thy neighbor's." These illustrations show that even as endowed with these competing instincts the individual is bound to develop a complex self, in which ideas of others play their part as truly as ideas of bodily or more exclusive and private interests.

But in group life the self is not a complex of interests which borrow their strength solely from the physical constitution. The process of organization begins and goes forward, not with reference solely to a private, personal focus, but with reference to some group, or to the tension between some group interest and some private interest. The primitive man finds most of the technique of life —

his occupation, his lodging, his costume, his fighting, his religion — all set for him. In all these he thinks and speaks less as "I" than as "we." The Arabs never say, "The blood of M. or N. has been spilt," naming the man; they say, "Our blood has been spilt." Or, if as "I" in marriage, in food supply, it is often not "I" as a person with hopes and purposes, but I as a member of the wolf totem; I as the mother of heroes; I as head of the clan. The child in like manner begins to organize his interests not from a single, permanent, exclusive centre; he is rather, as Baldwin has pointed out, now the learner, now the teacher, now the dependent, now the aggressive tyrant, because he not only works out his own instincts, but also on occasion plays the rôle of various personalities of his group.

Neither in the case of man in group life nor in the case of the child is there complete individuality. But the cases are otherwise not identical. The child's lack of individuality signifies rather an incomplete organization of interests about any single centre; he plays many rôles. This plurality is due, on the one hand, to the great variety of impulses pressing for expression, and on the other to imitation or suggestion, and on this second side is relatively more connected with the nature of the learning or cognitive process. The lack of individuality in primitive man is rather a positive solidarity of interest, a habit of working, feeling, and living as part of a group. This is due, not to the imitation or suggestion of other persons, but rather to the objective organization of his life.

Two tensions are soon set up. (*a*) The group self is not all. Specific impulses — notably those for food, possession, emulation — provoke the individual either to separate his interests or to use the group instead of merely identifying himself with it. (*b*) At the same time

there is another tension set up, — that between the simple, immediate satisfaction of impulse or desire and the more remote or complex good. Various factors may contribute to this: physically there is the appearance and selection of variations in the line of greater intelligence; socially there is the machinery of exchange, and the premium placed on property or other product of forethought; individually there is the satisfaction felt or anticipated in an expanding self.

The distinction between these two tensions is not usually felt. The control of the remote over the present is presented to the primitive man in group life as a control by the old men, by the customs which represent the ways of the forefathers, by the clan heads, the kindred gods — totem, ancestral, or covenant. Reverence for law is, at first, respect for personal representatives of the social order. It begins when the parent, who embodies superior power and knowledge, brings these to bear *sympathetically* upon the child's problems, or conduct, in such wise that the child sympathetically takes a similar attitude of control. It develops as larger groups always are found to involve the same dual aspect, by which every member is both sovereign and subject. It is especially fostered by ceremonies of initiation and religious mystery.

Spencer makes similar distinction of the two antitheses in moral conduct, — immediate (or simple) *versus* remote (or complex), and private *versus* social control; but the whole point of the present view as against Spencer's is that the antithesis is not between the self as a separate person, and the other — society, rulers, gods — as separate persons. The separation, unless in the case of violence, is the *end* of the process, not the beginning. The "visible ruler," the "invisible ruler," the "public opinion" all belong to the group. Sometimes they threaten or punish,

but more often they coöperate with the member. They aid him with food or with water; they fight for him and against his enemies; they avenge his wrongs. The "spirit" of the deity comes upon a Samson or a Jephthah in time of personal or tribal crisis.

The evolution of honor and justice illustrates conspicuously the fusion, in early stages, of the social and rational controls; at the same time it shows the process of the formation of standards and the evolution of individuality.

Honor implies, first, a common group sentiment and a sensitiveness to this sentiment. The group opinion is the standard for conduct. This is so far social, in a rather external sense. But the standard and the motivation imply more than the externally social, as is manifest when we ask, On what basis does a group praise or blame? In giving that sort of praise or approval which belongs to honor, the members of the group do not react as individuals merely, praising what pleases them as individuals. They react more or less completely from the group point of view, for they do not honor the man who is definitely seeking their applause and that alone, *i. e.* the man who seeks to please them as individuals; they honor the man who embodies the group ideal of courage or other admirable and respected qualities. In like manner a "sense of honor" in the individual implies more than a desire to receive the praise and avoid the blame of others. It implies a desire to be *worthy* of the praise or blame; this means a desire to act as a true social individual, for it is only the true member of the group — true clansman, true patriot, true martyr — who appeals to the other members when they judge as members, and not selfishly.

But the distinctions between "seeking honor" and seeking to be "worthy of honor" provoke naturally an-

other question. What is the true interest of the group? Is there any rational basis for this idea rather than that? So the Greek asked for the meaning of the καλόν. The way is thus open to the transition from honor to "right" as standard, and "duty" as motive. Honor means psychologically (1) that the *ego* pole in the developing self must measure its values by the *alter's* standards, and (2) in order to gain value in the *alter's* eye must cease to be mere ego and broaden itself to the aims and values of the whole social self.

Right or law (the word is the same in Greek, Latin, German, French) begins likewise, as will appear, with a personal edict or decision, and gradually loses this personal character to become objective and rational. Psychologically, it is therefore the recognition of the standard presented by the *alter* pole with the backing of the whole self. What, then, are the differences between honor and right? Four may be noted: —

1. Honor is fixed rather by the traditions or sentiments of a group than by reason or principle. It is thus better fitted to hold the undeveloped man or the boy until reason can make stronger appeal; often, of course, it holds him against reason.

2. It is more limited in reference. It always implies the group. Right may start with a limited vision, but its very logic forces it to become general. To give a reason implies an appeal to a universal standard, and law has attempted to give reasons. Honor implies some specific class: the honor of a gentleman, of a king, of a college student, of a soldier, of a woman, is each a distinct code. The soldier may be impure, he may not show fear; the woman may show fear, she must be chaste.

3. It has a more personal, concrete support, since it dwells constantly in the minds of the persons of the group,

who enforce it with praise or ridicule. The conception of what is right is not so constantly supported and reinforced.

4. It does not involve so sharply defined a personal responsibility as the conception of right and wrong. An erring son may bring shame upon his parents; a wife's act may injure her husband's honor (although it would probably not be considered that a husband could injure a wife's honor in the same way). The conception accords in this with what has been noted as to the lack of personal responsibility in group life.

The standard and sentiment of honor may therefore be regarded as a preparation for the more definitely rational conceptions of right and duty. It marks also an earlier stage in the evolution of individuality. For the self of honor is more completely immersed in the group self. The individual has less opinion and principle of his own. He is "with the gang." The "gang" or the "union," or the less organized but no less influential class based on wealth or respectability, decides for its members which laws they will keep, and which they may break without loss of standing, and — so far as they are in this stage of moral evolution — without scruples of conscience.

Personality reaches a clearer definition, the self rises to new strength and becomes at the same time more completely socialized and rational, when it reaches the level of *rights*. In correlation with this comes recognition of the rights of others, or *justice*, and as determining and guaranteeing such rights a *law* or standard which claims respect and fixes duty. All this seems a somewhat complicated and difficult process, but in the evolution of law, which, we must remember, is not distinct from morality until a later stage, we can see the steps so clearly as to make the psychological interpretation easy. Above all,

the historical material shows with complete evidence the fusion of the rational and social factors, and makes any such separation as that of Spencer or of Kidd, untenable.

Carrying out the figure of a bi-polar self, rights represent the *ego* pole reinforced by the consciousness of identity with the whole; justice, or recognition of rights of others, represents the recognition of the *alter* pole as reinforced by the whole; law or right is the whole social self viewed as standard and authority; duty is either personal as directed toward the *alter*, or impersonal and rational as directed toward the whole self as law or right.

First, consider rights. Rights grow out of the self-assertive instincts, in so far as these are both reinforced by social aid and transformed by being viewed and asserted from a social standpoint. To get social reinforcement the private claim to life or liberty or property must pay the price. And the price is some socializing of the claim. But to socialize is to rationalize as well; the group will assist only what is in some sense "fair," and fairness involves a rational, as opposed to a merely impulsive or passionate standard. Other claims must be heard, counted (in early law), or weighed. Shares must be equalized, and consistency in successive or simultaneous distributions observed. Fairness can be claimed only as it is recognized; a standard thus gains recognition which involves in germ all the moral elements. It grows, not by spontaneous generation, but out of the necessity on the part of the group to control conflicting interests.

The evolution of law and justice illustrates these steps in detail. First, the beginnings of rights to property in both Roman and Germanic law are in possession or seisin. But this is not yet ownership. For this idea there is needed first a conflicting claim. In Germanic law, says Pollock,[1]

[1] *The Expansion of the Common Law*, p. 12.

"The notion of ownership as the maximum of claim or right in a specific thing allowed by law is not primary, but developed out of conflicting claims to possession and disposal." The next step is the social support of witnesses, and if necessary the reference to some umpire. Similar steps can be traced in Roman law.

But while "personal power of act" is declared by Ihering to be "the mother and legitimate protector of right," this personal power is not naked physical strength, but the real manifestation and assertion of personality, a power active in the service of the idea of right.

Similar steps of (1) assertion of impulse, (2) social support, (3) social standard can be traced in criminal law. The first step is the impulsive reaction of resentment and revenge. But in group life unity of blood enlists the support of the kin. Even against outsiders, however, some check is felt, for a feud which may involve the whole clan in war, or require a *Wergeld* levied on all, must claim some social and reasonable justification. An offense against a fellow member of the group requires still more an adjustment of penalty, — a decision from the old men or the rulers. The application of this standard and control gives at first a sort of duel under public supervision. Greater solemnity may invest the duel when it is conceived that the divine decision is given through the issue. All ordeals and oaths assume such a divine oversight. There is here a social standard, but (*a*) it is irregular and likely to fluctuate according to the power and position of the offender, or the sympathies of the judges; (*b*) it permits the individual to be the agent in carrying out the judgment, and therefore it only limits passion and does not give the process a completely judicial form.

Advance takes place in both directions. (*a*) Instead of deciding each case by itself, when the temptation is to

invent a principle *ad hoc*, the ruler or judge follows past precedents or customs. A legal tradition is thus established, which, however imperfect, is likely to be more impartial than decisions growing out of the specific circumstances. The generality, though numerical, is in the making. (*b*) The group inflicts the penalty through a public official; although it is instructive to note, as illustrated by the "police" among the American Indians, that official character is a matter of degree. The warrior of sufficient age and distinction becomes by this fact invested with group authority. The generality of the standard demands a general agent.

It is possible to trace also a quantitative growth in the idea of rights and law. At first a man has rights only as he belongs to some group. If none but his kin support him, how should the conception of a general claim, a general right, come to consciousness? A man without a group is an outlaw, and for Greek or Jew the barbarian or gentile has no rights. So a "peace" is a local and limited sphere of rights. Householder, church, sheriff, each has his or its peace of graded worth, and the king's peace, most extended and most costly to break, is at the head of the list.[1]

Finally, we have the conception attained of a universal standard, but this is nevertheless first symbolized in ideal personalities. A divine law, a divine king who as judge of all the earth must do right, whose throne is habited by justice and judgment, a judgment of Osiris or Rhadamanthus where there is no respect of persons, or — where a religious philosophy has replaced personal by impersonal conceptions — a law of nature represents this final stage.

[1] Pollock and Maitland, *History of English Law*, ii, 454 ; *Expansion of the Common Law*, p. 152.

Hand in hand with the evolution of the conception of honor, law, and right goes the evolution of the moral sentiments of reverence and duty. First comes no doubt the sense of honor and shame in response to social judgments. But as we have seen, sensitiveness to these involves a capacity by the self to judge socially. When now we pass from the more or less partial spectator of group membership to the "impartial spectator" involved in right and conscience, and from the authority of a limited group to the authority of duty, we find that duty long continues to present itself in personal form. Authority is not of the pure reason but of the group, visible and invisible. But this is not a heteronomy. The sentiment felt — in so far as it is in any sense moral — is not fear, but respect, αἰδῶς. It involves kinship as well as superiority.

The process of organizing impulsive activity into a reliable and responsible character has its chief development through the two agencies of social pressure and self-directed work. As civilization advances and gets a stronger leverage in the individual motives, work becomes more and more significant as an organizing agency. Work implies an end more or less remote. The present activity need not be positively unpleasant and without any interest, as in drudgery, but on the other hand the interest is not chiefly immediate, as in play. Therefore in work the mind must project itself into the future, and thus organize activity with reference to this future. Continuance of work means continuity of the self as will. Common life constantly bears witness to the moralizing effects of work.

But in formation of character, as in formation of a standard, the ideal content comes at first in personal embodiment. The little child will not work long. The savage,

aside from the irrelevant complaints of white men that he does not gladly exhaust himself for their benefit or for the — to him — worthless inducements they offer, is also less capable of long-continued work than the civilized man. In both child and primitive man social support is necessary. Custom embodied in institutions and modes of life holds primitive man, and the child as well, to a certain measure of stability on the one hand, while the consciousness of responsibility is evoked by more positive social pressure. This latter holds the doer vigorously to account for his deed — and for that of his whole group as well — and visits him and his with heavy penalty if it be injurious.

In early society and early law, and likewise in childhood, the conception of responsible personality is undeveloped in two respects: (*a*) the group rather than the individual is conceived as responsible; (*b*) intention is not necessary, and hence even animals or inanimate things are regarded as responsible, and little or no distinction is made between accidental and malicious mischief. Illustrations of the first aspect are afforded by the theories of blood revenge,[1] and of clan or family responsibility in all peoples; the emergence to a conception of individual responsibility is finely argued against a conservative theory of solidarity by Ezekiel (ch. xviii). Illustrations of the transitional stages in the second aspect are found in the Hebrew cities of refuge for the accidental homicide.

Both aspects are conspicuous in the development of Germanic and English law.[2] In early Germanic law the doer was responsible whether he acted innocently or inadvertently; the owner of an instrument which caused harm was responsible because he was the owner, though the

[1] Steinmetz, *Ethnologische Studien zur ersten Entwicklung der Strafe.*

[2] The researches of Grimm and Bruner are summarized, and related to the English development by I. H. Wigmore, in *Harvard Law Review*, vol. vii.

instrument had been wielded by a thief; the owner of an animal, the master of a slave, was responsible because he was associated with it as owner or master; the oath-helper who swore in support of the party's oath was responsible without regard to his belief or his good faith; one who merely attempted an evil was not liable, because there was no evil result to attribute to him; where several coöperated equally, a lot (frequently) was cast to select which one should be amenable; while the one who harbored or assisted the wrong-doer, even unwittingly, was guilty because he had associated himself with one tainted by the evil result. The development of responsibility passes in general through three stages: (1) The idea of misadventure is hazily evolved and facts of the sort are regarded as ground for an appeal to mercy; the blood feud cannot be started. (2) The offender must pay a fine, or in the case of an injury by his animal he may free himself by handing over the animal, or later, by turning it loose and disavowing it; or in the case of injury done by an inanimate thing, by surrendering it or abstaining from using it. The thing, animate or inanimate, which caused the death of a human being was even so late as 1846 in theory "deodand,"[1] to be handed over to the king for pious uses, "for the appeasing of God's wrath. (3) Finally, an oath that the owner or master was not privy to the crime, or later, not aware, was received as exculpation.[2]

All these facts show the early social tendency to require responsibility; but where one was held responsible always and only for results, without regard to intention or motive,

[1] Pollock and Maitland, *History of English Law*, ii, 473.

[2] The Code of Hammurabi recognizes intent to some degree (§ 206, p. 75, Harper's Translation), but on the other hand the surgeon who by an unsuccessful operation caused death or loss of an eye must himself have his fingers cut off (p. 79). Similarly the American Indians were quicker to plead absence of intent than to admit the plea. Eastman, *Indian Boyhood*.

it was natural to try to shift responsibility. The scapegoat of Israel has become proverbial. In the case of the child, ruling out the cases where there is a deliberate and intelligent purpose to escape responsibility, there is yet an instructive remainder of cases in which the child finds a real satisfaction in saying, "I did n't break the window, the stone did it;" "I did n't knock off your hat, my hand did it." The conception of personal agency is still sufficiently fluid to afford him a plausible make-believe.

A more advanced and fruitful mode of developing responsibility is that of voluntary contracts or promises. A conspicuous illustration of the moral possibilities in this process is the appeal to the covenant with Jehovah which the prophets of Israel continually made, and it is certainly psychologically sound to see in this one important source for the ethical development of Israel's religion.

Sincerity, or to speak psychologically, directness and undivided interest, is at the outset spontaneous. The problem here is rather that of the development of a more conscious singleness of aim, "purity of heart," or psychologically, the full enlistment of the self in the aim, so as to yield emotional satisfaction.

"He who abstains . . . and rejoices in the abstinence is temperate." This mature and consciously maintained purity of motive implies previous conscious recognition of other ends and their deliberate rejection. The temptation to indirection or hypocrisy comes ordinarily either from fear of social penalties, from desire to conform to social standards and at the same time not fully socialize the self, or, finally, to gain more definitely egoistic results by exploiting one's fellows. Children's lies or insincerity are more likely to fall under one of the first heads, but it is significant that craft and the opposite of single-minded-

ness have a place in the folk-tales of many peoples. Jacob and Ulysses used their cleverness chiefly against those of another clan, it is true, and in diplomacy and international relations generally we are still too crudely moral — or immoral — to throw any stones; but the Greeks deified duplicity in Hermes, and the fact that Jacob is represented as deceiving both father and brother and at the same time as the especial favorite of Jehovah shows that the time was yet far when the psalmist could cry, "Thou desirest truth in the inward parts." Experiences of marital infidelity[1] seem to have borne a prominent part in the Hebrew evolution of the supreme value of faithfulness. In Greece, on the other hand, the æsthetic ideal of manly strength as portrayed in the Achilles of the Iliad, or in Pindar's Apollo, aided later by the scientific spirit of philosophers and historians, scorned deception as weakness or found it incompatible with the very essence of scientific pursuits.

Sincerity and truthfulness as purely formal virtues, or duties to self, do not, however, flourish without the aid of the social feeling. Sympathy likewise is at the outset instinctive. But as such it is only the basis for moral sympathy; it is not itself moral. To become complete it needs (*a*) intellectual widening through the growth of imagination, enabling the individual to enter into the experience of others; this has been emphasized by Adam Smith and recently by Cooley; (*b*) volitional strengthening through conscious purpose to make others' good one's own. It is not enough that I put myself in another's place, although this is the first requisite; I must also face the fact that to sympathize with him involves pain for me, and must nevertheless continue to sympathize. His good must form part of my good, and must be valued in itself, not merely as a means to my comfort or pride.

[1] Hosea, Ezekiel.

This conscious issue between self and others is raised by the growth of individuality in any form. Economic differentiation of interest is the most powerful agent — particularly the advance of private property; but the assertion of self interest in any form — political independence, rivalry in all its forms, sex jealousy, or desire to be free from parental control — may bring it to the front and point the diverging paths of selfishness or a more completed social self. But before the day of crisis comes the individual's instinctive sympathy has been powerfully reinforced by a multitude of social agencies. The constant companionship of the family circle, the atmosphere of tenderness which the parental care affords; the association with the clan in the thrilling experiences of war and chase, where a common cause evokes not only like feelings, but a will and therefore emotion for a good which is not private but common; the festivals which by dance and song give each his share in common service and celebration of tribal god or tribal victory; the solemn or joyous participation by the group in the significant experiences of birth and marriage and death; the embodiment of clan or ancestral achievement in poetry whose recital causes the group to live over with common pride or common suffering the glories and calamities of other days until every one feels that the clan's history is his history, the clan's blood his blood, — all this deepens and strengthens the bonds between man and man. This is one great function of art in moral evolution.

The other is that of embodying the ideals and value of rare moments in permanent form; of presenting to the many the visions of the few; of lending all the thrill and power of emotion to the conceptions of the spirit.

The emotional forces are reinforced, and, as civilization advances, largely superseded by volitional forces. The

fact of a common end is by far the greatest socializing tie when once it asserts itself. The coöperation of the savage tribe in the hunt gives place to the more indirect but far more intricate mutual interdependence of various industries. Exchange and commerce break down clan barriers. The successive creation or emergence under social advance of new wants which can be satisfied only through common action or reciprocal service, is itself the strongest socializing force. Social humanity continually provides new ends and therefore new motives for socialization. If any institution resists the process, it must conform or give way.

Idealization of ends and individualization of character go on in conjunction with the formal and socializing processes. The great agency here also is the transforming influence of social forces upon the primal impulses.

To satisfy hunger and thirst and protect from cold are necessary, but if the process is purely individual it has little moral significance. But under social organization and especially under the extension of the group to include invisible members, the common meal, the festal celebration, the family hearth become fruitful not only for promoting sympathy and piety, but also for teaching man that he does not live by bread only.

Resentment and anger are likewise necessary, but as private impulses may be brutal. Given the social pressure of the kinship bond, and note the idealizing effect. Sympathy, loyalty to the interests of the group, courage in its cause, celebration in dance, song, and epic, in stone and color, lend first social and then ideal interest to those impulsive activities. A conception of the "goël," or next-of-kin, who is at first primarily the helper in defense or attack, may become idealized as the "Redeemer" to become the bearer of the highest spiritual meaning.

The impulse of sex, likewise essential to the race, is also so instinct with passion as often to be regarded rather as enemy than as ally to moral progress. But under social pressure it is likewise transformed. Prescribing who shall not marry, and often more positively who must marry, celebrating nuptials with solemn or festal ceremony and with all the aids of art, controlling to some degree the conduct of the parties after marriage and the conditions under which they may be dissolved, the social group has coöperated with the parental instinct and the instincts of possession, in transforming the sex relation from one of transient, and often utterly regardless, passion to one of thoughtful, permanent, tender union of ideal interests and reciprocal service.

The *division of labor* is a notable factor contributed by social organization to the idealizing and individualizing process. If all must do the same thing, individuality has relatively little opportunity. It is when the Beethoven finds his music, the Sophocles his stage, the Alexander his army, the Hildebrand his church, the Newton his study, that the capacity and individuality of the man shows itself. Group life in its simplest phases has little differentiation except "for counsel" or "for war." But with metal-working and agricultural life the field widens. At first the specializing is more largely by families than by individual choice. Castes of workmen may take the place of mere kinship ties. Later on the rules of caste in turn become a hindrance to individuality, and must be broken down if the individual is to emerge to full self-direction.

The lines of development traced thus far would fall for the most part within the period prior to the emergence of the full and clear consciousness of the moral as

such. Particular things are approved or condemned; standards adequate to this are set up; responsibility is demanded and in a measure attained; social control is recognized and social sympathy felt. But the questions, What do right and wrong mean? What is the basis of authority? What is the real or supreme good, as contrasted with the seeming or partial goods? How is one to determine moral laws? What is the necessity for "disinterested benevolence" or purity of motive? — in a word, all the questions involved in the fully conscientious attitude are not raised in their general significance. This stage in primitive life corresponds in general, as has often been remarked, to the period of childhood prior to adolescence, although in many respects it has of course marked differences. The broader and deeper view of the significance of conduct is evoked when the self rises to a higher level, either (*a*) by its own inherent development[1] or (*b*) under the strain of meeting new situations, physical or social, for which old habits and methods prove inadequate. The process in question involves, in psychological terms, the breaking down of old habits which obstruct growth, the formation of new ideals and standards of valuation, and the reconstruction of the self. We note briefly some of the experiences which bring this about:

(*a*) Changes in industrial and economic conditions may compel or induce such reconstruction by abolishing older social and religious sanctions connected with the older form of industry, or positively by affording new opportunity

[1] The question may be asked whether the self would develop except under the conditions named in (*b*). In the case of races the answer may very likely be negative; we see numerous races which have never risen to the level indicated. In the case of the individual, however, we may distinguish for purposes of analysis (*a*) such growth as is due to the normal increase in intelligence, and to the general emotional changes due, for example, to the adolescent period, and (*b*) changes due more directly to physical or social stimulus.

and incentive to individual as *versus* social development. Grosse[1] has shown the intimate relation between clan organization and the various types of industry. The change from nomadic to agricultural life led to such change in Israël's organization that the historian declared, "Every man did that which was right in his own eyes," nevertheless it ultimately gave opportunity for great moral advance. It was the spirit of the old Japan which furnished the morale of the late war. It will be interesting to see what the new industrial order will bring about.

(*b*) The growth of knowledge, with its connected comparison and criticism, may condemn the old. This is too familiar, both in the development of the young and in the historic instances of the Greek and the modern epochs of enlightenment and emancipation, to need further comment.

(*c*) Calamities or painful shocks may shatter old habits and ideals, or change the valuations. This again is a familiar experience. The problem of evil, whether national or personal, may substitute spiritual for temporal values as supreme.[2]

(*d*) More general, perhaps, than any of the foregoing is the *expansion of the self due to emotional tides*, either natural or induced. The adolescent period is one world-wide illustration. But the almost equally universal phenomena of ecstatic or mystical religious rites and experiences are equally in point. From Hebrew prophecy, Greek mysteries, and Buddhist or Neo-Platoist contemplative ecstasy, down to the ecstatic states of American Indians or African negroes, emotional experiences have functioned as agencies for lifting the worshiper into union with his God, and thus, temporarily at least, of raising him to a new level. The modern theory of emotion as representing

[1] *Die Formen der Familie.* [2] Cf. Job, Habakkuk.

pent-up impulse and deeper reverberation gives the psychological interpretation for the mystic elevations, and moral reformations thus made possible.

The new significance of the religious ritual, religious belief, and religious emotion after such processes of moral deepening deserves special mention. Religion is immensely important in the early stages of moral evolution; but its significance there is chiefly of two sorts: (1) It means a widening and strengthening of the social group, and therefore a reinforcement of whatever influences the visible group asserts. (2) The superior and mysterious nature of the deities or other unseen beings, manifested through such conceptions as taboos, cleanness and uncleanness, holiness and sin, gives to conduct in its relations to the gods a peculiar and extraordinary enhancement. This does not mean any distinctively moral quality — on the content side, at least. The religious is largely confined to ritual, and concerns itself little with the relations of man to his fellows. The conceptions are moreover largely external and magical rather than internal and ethical. Taboos, cleanness, uncleanness, holiness were all contagious. Contact with birth or natural death polluted as truly if not so deeply as the shed blood which cried aloud from the ground. The women who were "holy" [1] to the gods at the Canaanite shrines were not, even by the standards of the time, of any distinctively moral quality. Sacrifice, prayer, and other acts of ritual were in part an expression of community with kindred gods, but were also the means for gaining favor or averting wrath. Even the poignant consciousness of sin manifested in the Babylonian psalter is largely without moral quality, and the ascetic rites of various primitive peoples are comparable to rites of "purification" in the externality of the

[1] Gen. xxxviii, 12–23.

underlying ideas. Nevertheless even here there was far more than the bare fear which some have found as the sole content of primitive religion, even if there was not as yet possible the complete reverence which has within it the element of ethical respect. For in ritual and cultus man was acknowledging a higher order, powerful and permanent; in the mysterious there is something which lures and challenges, and in its developed phases makes the mystic feel at one with his object; in the feeling of dependence there is the docility which works against self-sufficiency and stagnation; in the consciousness of sin as a failure, a missing of the mark, there is implied failure to measure up to a standard, an implied inadequacy of the present self, and consequently the stimulus to reconstruction.

But when once a distinctively moral function or social relationship has been incorporated into the conception of the deity, — when the god is protector, judge, father, husband, or redeemer of kin, all the added sacredness of religious conceptions is transferred to the moral. Wrong becomes sin; iniquity becomes impurity; the awfulness of Sinai invests the moral law; the mystic vision, the emotional seizure, become the initial impulse to a life of moral enthusiasm and spiritual power.

II

THE EXPANSION OF EUROPE IN ITS INFLUENCE UPON POPULATION

Walter Francis Willcox

In a brilliant and suggestive series of lectures, from the publication of which the modern imperialistic movement in England has sometimes been dated and which he called "The Expansion of England," the late Professor Seeley attempted to prove that the keynote of modern European history is found in the competition of the several powers for transmarine expansion and the establishment of a colonial empire. This competition, he showed, had resulted in the triumph of England in 1763, the speedy dismemberment of her empire in 1783, the strenuous and persistent but finally unsuccessful efforts of her main rival, France, under the guidance of Napoleon, to regain the lost leadership in Europe, and the rise of a second British empire after the first had fallen asunder. To one not of British birth and not primarily interested in politics, the query suggests itself whether Seeley's thesis may not be put in a more general form. Is not the centre of modern history found in the efforts at expansion, not of England, but of Europe? Is it not true that soon after the discovery of America and of the ocean route to India those efforts on the part of Europe, and especially of the maritime powers, encountered less resistance in the newly opened lands than they did within Europe itself? Did not the stress of their competition in consequence become more and more extra-European? Were not its essential

elements quite as largely economic as political or military? Did it not strive more or less blindly for the advantage and the increase of the people as well as for the glory and prestige of the state?

To a non-European student of population these questions seem answerable in the affirmative. Certain it is that from this point of view there is nothing in the history of the last few centuries more notable than the increase in the population of the world and the degree to which that increase has been a result, direct or indirect, of the expansion of Europe.

To get a clear idea of the increase in the population of Europe it is well to begin with a brief review of the serious efforts to measure that population, taking them up in their chronological order. In 1660 Riccioli estimated the population of Europe at 100,000,000;[1] in 1685 Isaac Vossius sharply criticised his conclusion, writing: "The statement that Europe maintains 100,000,000 souls is most wide of the truth; on the contrary, if all Africa and America be included, that total would not be reached." Vossius assigned to Europe only 30,000,000.[2] The latter's estimate may have been reduced by his knowledge of the great destruction of life caused by the Thirty Years' War.

In 1741 Süssmilch concluded that there were 150,000,000 persons in Europe, and in 1761 reduced his estimate to 130,000,000. His later result practically controlled the opinion of students down into the nineteenth century.

Arranging the significant estimates of the population

[1] The date usually given for this estimate is 1660. The work containing it (*Geographiae et Hydrographiae Reformatae Libri XII*) is said to have been published in Venice in 1672. *Die Bevölkerung der Erde*, vol. ii, p. 4b, footnote. But the Library of the British Museum contains an edition dated 1661.

[2] Isaac Vossius, *Variarum Observationum Liber*. London, 1685, pp. 66–68. His discussion of the population of the earth is a digression in a consideration of the size of Chinese cities. *Ibid.*

of Europe since the middle of the eighteenth century in the chronological order of the dates for which they speak, we have the following series: [1] —

TABLE I. — POPULATION OF EUROPE.

Date	Authority	Population in Millions	Date	Authority	Population in Millions
1741	Süssmilch	150	1876	Behm u. Wagner	309
1761	Süssmilch	130	1878	Behm u. Wagner	312
1789	Black	150	1878	Levasseur	326
1800	Levasseur	175	1880	Behm u. Wagner	316
1804	Volney	142	1880	Levasseur	331
1809	Hassel	179	1882	Behm u. Wagner	328
1810	Malte-Brun	170	1886	Levasseur u. Bodio	347
1824	Hassel	207	1892	Wagner u. Supan	357
1828	Balbi	228	1894	von Juraschek	365
1828	Bergius	223	1895	von Juraschek	366
1828	Hassel	211	1896	von Juraschek	373
1830	Levasseur	216	1897	von Juraschek	379
1840	von Roon	237	1898	von Juraschek	381
1843	Berghaus	296	1899	von Juraschek	382
1854	von Reden	266	1899	Supan	381
1859	Dieterici	272	1900	von Juraschek	401
1860	Levasseur	289	1900	Levasseur u. Bodio	391
1866	Behm	285	1901	von Juraschek	391
1868	Behm	293	1902	von Juraschek	392
1870	Behm	295	1903	von Juraschek	393
1872	Behm u. Wagner	301	1904	von Juraschek	393
1874	Behm u. Wagner	301	1905	von Juraschek	402
1875	Behm u. Wagner	303			

Table I shows an almost steady but irregular increase in the figures from the estimate of Süssmilch in 1761 to the present day. No doubt there has been within that period a steady and rapid growth in the population of Europe. But much of the increase may be due to the increased accuracy of measurement. It is important, therefore, to judge whether the earliest in this series of figures is entitled to any confidence.

In the celebrated chapter [2] in which Süssmilch attempted

[1] Extended from a table in *Die Bevölkerung der Erde*, vol. ii, p. 5 (1874).

[2] *Die Göttliche Ordnung* (ed. 1761), ch. xx, "An Attempt to estimate the Number of Persons who could live on the Earth and the Number who do live on it."

to ascertain the possible and actual population of the earth, he pointed out at the start how little was known of the extent and populousness of the land in the Southern Hemisphere, and that in northern America. He concluded that about one fourth of the surface of the earth, land and water included, or 2,322,000 German square miles, each equal to 16 English geographical square miles, was inhabited land. To estimate the possible population of the earth he examined how much grain a German square mile would produce, and how many people could be sustained for a year by that yield. After allowing for variations in fertility and for one third of the land to lie fallow each year, he concluded that an average German square mile could produce enough grain to support 8750 adult men for a year. As children, who constitute one third of the population, do not need so much, and as on the other hand much of the land must be used for growing fodder for cattle and for other products, Süssmilch reduced the figures from 8750 to 6000 as the number of persons of all ages and both sexes who might obtain bread, meat, vegetables, and drink from a German square mile. Multiplying the 2,322,000 square miles of inhabited land on the earth by 6000, he reached 13,932,000,000 as the possible population of the earth. But he was quite willing to reduce this figure to 10,000,000,000, or even to 5,000,000,000, being concerned only to prove that the earth was not supporting nearly as many persons as it might. He compared his results with those of Vauban in 1707, following the same method and reaching 5,472,000,000 as the possible population of the earth.[1] The area of the several countries of Europe was next considered. The figures of

[1] In a posthumous edition these results are compared also with those of Leeuwenhoek, in 1679, who reached 13,385,000,000 as the possible population of the earth.

Vauban indicated that 147 people might be supported on an English geographical square mile; his own indicated 375. He took 200 as a round intermediate figure and concluded that if all Europe were as thickly settled as that, it would contain 550,000,000 inhabitants.

Süssmilch turned next from the region of vague possibilities to that of realities and attempted to estimate from the best obtainable evidence the population of the several countries of Europe. A critical review of his arguments and conclusions on a point of fundamental importance for my argument will be found in the first appendix to this article. Such criticisms as I have been able to give his figures point to the conclusion that their net error is somewhat on the side of excess and that the population of Europe in 1750 was probably somewhat below 130,000,000. We may accept this total, then, as near enough to the truth for present purposes. It will be noticed that the smaller the true population for 1750, the greater must have been the increase since that date. Any error by way of excess in the early figures tends to mask the true increase of population with which we are now concerned.

From Table I we may infer: —

1. The population of Europe more than trebled between 1760 and 1905.

2. The population of Europe about doubled between 1820 and 1900.

3. It increased by about 100,000,000 between 1820 and 1872, or in 52 years, and by another 100,000,000 between 1872 and 1905, or in 33 years.

4. There is no evidence of any decline in Europe's rate of growth, such as is usual with an increasing density of population and such as has been conspicuously true of the United States since 1860.

5. On the contrary the increase in Europe from 1860 to 1880 was 14 per cent and 1880 to 1900 was 21 per cent.

The first form which the expansion of Europe has taken is an enormous increase in the population of that continent averaging for each year of the nineteenth century over 2,000,000 and for each of the last twenty years of that century over 4,000,000.

Another and more familiar form of the expansion of Europe is the outflow of population from that continent to other parts of the world. In studying this form of expansion by the statistical method, the difficulties are even greater than in studying the increase of population in Europe, and our records cover a much shorter period. They are of two sorts, — the returns of persons leaving the several European countries each year for some extra-European country with the intention of remaining, and the returns of persons entering the ports of various extra-European countries from across the ocean each year with the intention of remaining. Returns of the first sort are obtainable for the United Kingdom and Norway since 1853, for Sweden since 1866, for Denmark since 1869, for Germany, Austria, and Hungary since 1871, for Portugal since 1872, for Italy since 1876, for the Netherlands since 1881, for Spain and Switzerland since 1882, and for Russia since 1885.

The recorded transoceanic emigration from the countries named shows the following totals by decades: —

Period.	Emigration over sea.
1853–59	1,244,000
1860–69	1,651,000
1870–79	2,725,000
1880–89	6,676,000
1890–99	6,181,000
1900–	652,000
Total	19,129,000

These figures greatly understate the total amount of emigration. On the other hand, the returns from the non-European countries, showing the immigration into them, probably overstate the amount of emigration from Europe. For present purposes it is unnecessary to state the latter figures and try to harmonize the two series. But even if we had accurate measures of these currents of migration from the beginning, they would be a most inadequate indication of the transmarine expansion of European population. The increase of population in the European colonies has usually been far more rapid than in the home country, and that increase has swelled the total extra-European population of European stock out of all proportion to the currents of migration. A clearer index of this form of the expansion of Europe may be found in the population figures.

From a careful survey of the population of European origin or descent living outside of Europe at the beginning of the twentieth century, it seems admissible to conclude that they number about 100,000,000. The countries to which I have assigned over 1,000,000 arranged in order are as follows:—

United States	67,400,000
Brazil	6,300,000
Canada	5,370,000
Russia in Asia	5,000,000
Australia and New Zealand	4,540,000
Argentina	4,085,000
Mexico	2,680,000
Cuba	1,152,000
Other countries	3,736,000
Total	100,263,000

The enormous increase of any one form of life is usually purchased at the expense of other competing forms which are displaced by the more efficient or serviceable type. Cattle and horses have displaced the buffalo

and antelope; wheat, maize, and cotton have restricted the range of prairie grass and forest, as the white man has that of the Indian, Australian, and Malay. Does this general principle hold true of the expansion of the population of Europe beyond the bounds of that continent? Have the 100,000,000 Europeans by blood now living outside of Europe simply taken the place of those of other blood? How has this great expansion of Europe affected the growth of other stocks?

In the United States, no doubt, the Indians have decreased while the whites increased. The same has been true of the native stock in the West Indies, Australia, and many islands of the Pacific. This has happened in so many cases, especially in temperate regions, that popular opinion probably believes it to be the prevailing result of the expansion of Europe. But that is a mistaken view. On the contrary it will appear that the net result of the expansion of Europe has been an enormous increase in the aboriginal population of the lands to which they have gone. A brief review of the evidence on this point for some leading areas will show that the popular opinion to the contrary has no adequate foundations.

United States. Exaggerated estimates have often been made of the number of Indians living within the present area of the United States about 1500 A. D. These estimates have gone as high as 25,000,000, and the usual unit employed in making them has been a million persons. But not long since, a very careful study of the subject was made by different persons in the United States Bureau of Ethnology under the direction of Major J. W. Powell, and the conclusion reached that the number of Indians then in the present United States was "somewhere between 500,000 and 1,000,000," and that there are now in the United States "about half as many Indians as

when the good queen sold her jewels." If we accept the mean of the two figures as the most probable estimate for 1500, and the enumeration of the Census Office in 1900, 268,000, as correct, this would indicate a decrease of about 500,000 Indians in four centuries.

Canada had 108,000 Indians in 1903, and it may fairly be doubted whether they were much more numerous on the same area in 1500. The evidence, arguments, and conclusions of the United States Bureau of Ethnology apply in the main to the northern neighbor, with the additional fact that the staple food plant of the Indians, maize, did not and does not thrive in most of Canada.

West Indies. The Indian population of Cuba at the date of its discovery has been variously estimated at between 200,000 and 1,000,000 Indians, and that of Porto Rico at between 100,000 and 600,000.[1] The smaller of each pair of figures is probably too large. This was clearly the opinion of Alexander von Humboldt regarding Cuba, and he is the best critical student who has examined the subject. His results are confirmed by more recent conclusions in other fields. Probably 500,000 would be much too large a figure for the entire aboriginal population of all the West Indies at the time of their discovery.

Mexico. The best source of information is Alexander von Humboldt, who passed a year in Mexico in 1803–1804, and who examined the question of population with care and critical acumen. I have found no estimate of the population of the present Mexico at the time of Cortez, and believe that no materials to base one upon are extant. But Humboldt is willing to affirm that "the whole of the vast region which we designate by the general name of New Spain (Mexico), is much better inhabited at present

[1] *Census of Cuba*, 1899, p. 65; *Census of Porto Rico*, 1899, p. 23.

than it was before the arrival of the Europeans."[1] The evidence offered for the conclusion is the spread of agriculture in Mexico to large, fertile, and well-settled districts which before the Spanish conquest were sparsely settled by pastoral or hunting tribes. The same authority concludes that the number of Indians in Mexico had been on the increase for the preceding fifty years, as he put it in one place, or for the preceding century, as elsewhere stated, the evidence being derived from "the registers of capitation or tribute."

At the beginning of the nineteenth century he estimated: "The number of Indians in New Spain exceeds two millions and a half, including only those who have no mixture of European or African blood."[2] It is usual to assume that about 37 per cent of the present population of Mexico is of pure Indian blood, which would mean nearly 5,200,000 Indians, and a doubling of the pure Indian population of Mexico during the nineteenth century alone. However wide a margin of error we may ascribe to these figures, it seems to me indisputable that the increase of the pure Indian population of Mexico since 1500 has been so great as more than to offset the decrease in other parts of North America, including the West Indies. If so, the pure Indian population of North America has increased in the last four centuries.

What is true of North America holds with even greater force of South America, which contains no such great areas as the eastern United States and Canada, in which the Indians have been displaced, and no areas like the West Indies, formerly well settled, in which the Indians have been exterminated. On the other hand, the processes of race mixture have gone further in South America than

[1] *Political Essay on New Spain*, English translation, vol. i, p. 71.

[2] *Idem*, p. 98.

in North America, and it would be difficult to show how much pure Indian blood remains on that continent. From various figures in the "Statesman's Year Book" and elsewhere I have estimated them as 6,700,000, and the entire number in the Western Hemisphere as 13,600,000. A. H. Keane reaches a much smaller figure, 9,900,000.[1] But I see no reason to believe that the number in 1500 A. D. approached 10,000,000. I conclude, therefore, that the influx of whites into America, while it may not have caused, has certainly been accompanied by, an increase of the Indians in that hemisphere.

Australasia. The migration of the European to Tasmania, Australia, and New Zealand has been attended by a decrease, and in the case of Tasmania, a disappearance of the aborigines. The numbers of the latter were small, 200,000 being, I judge, an outside estimate for the three areas.

To find an offset to this decrease of aborigines in Australia and New Zealand we need go no farther than *Java.* This island increased its population, the great mass of whom have no trace of European blood, from about 4,000,000 in 1800 to about 29,000,000 in 1900. It is almost as large as New York State, contains not one large city, and yet has not far from four times as many inhabitants as the Empire State, or more than one third as many people as the whole United States. This single case of increase in aboriginal population under the influence of Europe is enough to outweigh all the known decreases in all other parts of the world several times over. Nor is there any evidence of a slackening in the rate of Java's growth. More than half of the century's increase occurred during the last thirty years, in which period the population of Java increased more than 80 per cent, or about seven

[1] Mills, *International Geography*, p. 106.

tenths as fast as the United States during the same time. The present density of population in Java is about as great as that of Belgium and much greater than that of the most densely settled American State, Rhode Island. Yet we are told that not more than one third of the entire island is now under cultivation.

Changes of a similar sort but not of so remarkable a nature have been in progress in the *Philippine Islands*. "The earliest complete enumeration of the islands appears to have been . . . made in the year 1591." It showed a population of 667,000, and it is thought that this was if anything an exaggeration of the true numbers. "Their ancestors probably did not number more than half a million at the time of the Spanish settlement"[1] (1565 A. D.). There are now about 7,500,000 persons of native stock in the Archipelago.

For *India* I have found only two estimates of the population in the eighteenth century. Süssmilch, after a few general considerations, concludes that it cannot be assigned more than 100,000,000 inhabitants. And Burke some years later (1783) said in his Speech on Mr. Fox's East India Bill, "If we make the period of our estimate immediately before the utter desolation of the Carnatic (*i. e.* about 1760), we cannot in my opinion rate the population at much less than thirty millions of souls." Whether any weight be given to either of the preceding estimates, it is certain that the population of India increased greatly during the nineteenth century. The first census of India, that of 1872, showed a population of 186,000,000, but this was probably an understatement. The estimated population in 1851 was 178,500,000; that enumerated in 1901 was 231,900,000, an increase of 53,400,000 in 50 years, due in part to annexations of territory, but mainly to in-

[1] *Census of the Philippine Islands*, 1903, vol. i, p. 411.

crease on the same area. The increase in the population of India during the last half of the nineteenth century was almost exactly equal in amount to the increase in the United States during the same period.

In *Egypt* a similar change is in progress. The population in 1800 was estimated by the French at 2,460,000. The population in 1897 was counted by the English as 9,734,000, an increase nearly fourfold in the century during which Europe little more than doubled its population. The increase after the English took control of the finances in 1882 was more than twice as rapid as before that date and more rapid than the growth of the United States during the same period.

Changes less remarkable but of a similar sort are in progress in *Algiers*. Although French, Spaniards, Jews, and Italians constitute large and increasing groups of European population in that colony, yet the Mussulman population of native stock increased from 2,850,000 in 1881 to 4,072,000 in 1901, or 43 per cent in 20 years, about double the rate in Europe and not much less than the rate in the United States during the same period.

The expansion of Europe has had a stimulating more often than a retarding effect upon the increase of the aboriginal population. This influence has been exercised by the Spaniards in Mexico and the Philippines, probably by the Portuguese in Brazil, by the Dutch in Java, the French in Algiers, the English in India and Egypt.

In Mexico, Central and South America, and to a far less degree in other parts of the world, this expansion of Europe has resulted in the appearance of other millions of mixed blood, of whom Keane reckons in the Western Hemisphere 12,270,000 and I nearly twice that number. But the figures are too uncertain to base any argument upon.

Another aspect of the expansion of Europe should likewise be considered. The European race has carried the African with it to America, and that hemisphere now contains more than 13,000,000 negroes,[1] and North America with the West Indies now contains about two and one half times as many negroes as Indians. These negroes have increased with much greater rapidity than the negroes in Africa or the Indians in America and almost as fast as the whites in America. If an increase of population be deemed a test of prosperity, then the negro population of America has prospered in its new home.

In one instance the expansion of Europe has taken another form, the acceptance by a native people of the main industrial and economic features of European civilization. In the latter half of the nineteenth century the Japanese did this, and the results upon the increase of the Japanese population were most striking. Three censuses of Japan were taken in 1721, 1726, and 1732, each showing a population of more than 26,000,000 and less than 27,000,000. These results are believed "to be somewhat trustworthy." In 1828 another census was taken, showing a population of 27,000,000, and indicating that the population of Japan had been almost stationary for the preceding century. In 1871, only three years after Japan had been opened to foreign trade and intercourse and modern European institutions, the population was returned at 32,900,000, indicating an increase of about one fifth in the preceding 43 years.[2] In 1903 the population was 46,700,000, indicating an increase of more than two fifths in the preceding 32

[1] Keane estimates them as 20,000,000, doubtless by assigning to that race several millions of the mixed population of Central and South America, especially Brazil, for which I have reserved a separate class.

[2] Count Yanagisawa, "On the Progress of Statistics in Japan," in *Bulletin of International Statistical Institute*, vol. xii, part i, p. 349.

years. The population of Japan increased 12.9 per cent between 1893 and 1903, or more rapidly than any European country except Germany, Greece, and the Netherlands, and that notwithstanding the fact that five sixths of the population live in districts more thickly settled than Rhode Island.

Limitations of space forbid the further enumeration of instances. But those already given may suffice to show that where Europe has gone with its outflowing currents of population, its governmental institutions, or its influence, the population, both European and native, has felt the influence of Europe as a stimulus and has increased marvelously.

To establish any causal connection between the two it is important to show conversely that wherever Europe has not gone, population has not increased. Unfortunately where Europe has not gone the statistics are scanty or untrustworthy, and therefore this aspect of my thesis is not to be proved. But some evidence may be offered regarding the two main bodies of population still untouched by the vivifying influence of Europe, — the Chinese[1] and the inhabitants of Central Africa.

Regarding the former population of *China* I have found no evidence of equal weight with that given by Martini in 1655,[2] who bases himself upon the results of a Chinese census of 1651 which indicated 58,900,000 men. Martini adds that these were men, excluding children, women, soldiers, magistrates, priests, eunuchs, and the royal family, all of whom were untaxed. He concludes that this figure makes it admissible to estimate the entire population of China as 200,000,000. If this be correct it is

[1] The accessible statistical evidence regarding the population of China is critically reviewed in Appendix II.

[2] *Novus Atlas Sinensis*, quoted by Herman Wagner in *Die Bevölkerung der Erde*, vol. ii, p. 7.

probable that the population of China in the seventeenth century was at least double the population of Europe at the same date. According to a census which is said to have been taken in 1812, the population of China proper was 360,000,000; according to another in 1842, it was 413,000,000; according to "an estimate made for the purpose of the apportionment of the indemnity to the Powers" after the Boxer outbreak, it was 407,000,000; and according to an estimate by Professor Supan made after a thorough and critical sifting of the conflicting and treacherous evidence, it was 320,000,000 at about the end of the nineteenth century and 219,000,000 in 1776. If these estimates are correct China increased in population about two fifths in a century and a quarter, during which Europe was trebling in population. But I find it difficult to attach any importance to the Chinese figures. If in one instance they were padded because the Chinese emperor, not satisfied with the rate of increase of his people, ordered a careful count of them to be taken, and if that padding amounted to an excess of 48,000,000 over the true population, as Professor Supan argues, why may it not be the custom to report a normal increase regardless of the facts? Certainly the regularity of the increase shown in Supan's table is enough to arouse suspicion. On the whole, therefore, I prefer the earlier conclusion of Dr. Behm in 1882, that the best basis for an estimate of the present population of China is the census of 1812, namely, 350,000,000, supplemented by the assumption that the population since that date has been stationary, the calamties of civil war, famine, and flood having eaten up the natural increase. One writer on the subject living in China estimates the losses of life from the Taiping rebellion at 40,000,000 to 50,000,000; from the Mohammedan disorders in three provinces at 8,000,000 to 16,000,000, and

from the famine at the end of the seventies in five provinces at 13,000,000 to 17,000,000. So a correspondent of the London "Times" reported the number drowned by a flood of the Yellow River in 1887 at from 1,000,000 to 7,000,000.[1] Even though all these conjectural estimates may be much exaggerated, yet there is little doubt that the civil disorders and natural calamities which have afflicted China during the nineteenth century have been far more serious and far more destructive of life than those which have been felt either in Europe or in India.

Regarding the population of *Central Africa* we have even less information than for China. A suspicion that the population has been decreasing is awakened by the following series of estimates for the entire continent for a series of years: —

TABLE II. — ESTIMATED POPULATION OF AFRICA.

DATE.	AUTHORITY		DATE.	AUTHORITY	
	Bevölkerung der Erde.	Hübner's Tabellen.		Bevölkerung der Erde.	Hübner's Tabellen.
1872	193	–	1896		170
1874	203	–	1897	–	178
1875	206	–	1898	–	179
1876	200	–	1899	–	179
1878	205	–	1900	–	179
1880	206	199	1901	–	177
1882	206	–	1902	–	182
1891	164	–	1903	–	180
1893	–	169	1904	–	149
1894	–	169	1905	141	143
1895	–	169		–	

We know that during the period covered by the above figures nearly all the semi-civilized countries around the coast of Africa and under the control of Europe increased in population. It is clear, therefore, that the estimate for the remaining uncivilized parts must have fallen even more rapidly than the figures for the whole continent.

[1] *London Weekly Times*, January 13, 1888, p. 15.

Whether this is due to an actual decrease of the population or to an increased accuracy in what were previously overestimates does not appear. It seems to me probable that both influences have been at work. There is no question but that in Central Africa of recent years the losses of life have been terrible. The Mahdist revolt was most destructive. "About three-fifths of the whole population are said to have perished during the ten years from 1882 to 1892 through wars, famines, epidemics, plundering expeditions, and other calamities caused by the Mahdist revolt,"[1] which would mean a loss of 6,000,000. This influence was local, but the overland slave trade is not dead and is probably more destructive of life than the maritime slave trade ever was. A majority of the slaves who start on a caravan are said to perish on the road. Yet another almost universal check to population among the native tribes of Central Africa is executions for witchcraft. Miss Kingsley tells us: "The belief in witchcraft is the cause of more African deaths than anything else. It has killed and still kills more men and women than the slave trade."[2]

The preceding argument leads to these conclusions: —

Europe had more than three times as many inhabitants in 1900 as in 1750.

The persons of European stock living outside of Europe in 1900 were three fourths as many as the entire number of inhabitants of that continent in 1750.

This vast increase of Europeans by blood in 150 years from 130,000,000 to 500,000,000 has not been secured at the cost of a decrease of other human beings.

On the contrary the native stocks reached by Europeans have usually increased in numbers.

[1] A. H. Keane in Stanford's *Compendium:* Africa, vol. i, p. 419 (1895).
[2] Mary Kingsley, *Travels in West Africa*, pp. 462, 463.

This is true of nearly all numerous groups living mainly by agriculture in the tropical or subtropical regions of America, Africa, Asia, and Malaysia.

Where the influence of Europe has not gone and we have any clue to the facts, they indicate a stationary population, or at least a very low increase.

The enormous increase in the population of the earth from perhaps 1,000,000,000 in 1750 to 1,500,000,000 in 1900 must be ascribed mainly to the expansion of Europe.

An increase in the quantity of human life is not necessarily a good. If that increase had been purchased at the expense of quality, it might be doubtful whether mankind were the gainer. But this expansion of Europe has inured mainly to the benefit of higher and perhaps the highest types of mankind, and within those types the quality of life, so far as it is capable of measurement by the statistical method, has improved. The food supply is better and more regular; it is far more effectively distributed; many articles, like sugar, coffee, and tea, formerly luxuries the use of which was restricted to the very few, have come into general use; health has improved; life is longer; education more diffused; the pleasure derived from human association and from the dissemination of news is far more general and stimulating.

This great increase in the sum of human life maintained on the earth at any one time is not due primarily to any increase in the birth rate. More children are born, no doubt, but probably not more relatively to the population. On the contrary, the ratio of births to the population is probably lower than formerly and still decreasing. Even though the amount of water which falls into a lake shows no increase, yet if the outlet be clogged, the amount lying therein will increase rapidly. Mankind's

outlet from life is being clogged, — each individual tarries longer before he finds the gateway of death. The prime cause of the increase of mankind is the decrease in the ratio of deaths to population. Civilization has secured a greater mastery over the powers of nature, and in consequence the earth is enabled to support more men, and men of a higher type, and to stimulate their endeavor by all the evidences of progress realized and all the hopes for progress yet to be. Herein is a fundamental justification of the agricultural, industrial, and political civilization which has accomplished so grand a result.

APPENDIX I

Review of Sussmilch's Effort to estimate the Population of Europe about 1750

If the true population of Europe in 1750 was much larger than the estimate I have followed, then to that degree the argument to show that Europe has increased its population very greatly since that date loses in weight. It is essential, therefore, to review critically the evidence on which the estimate is based. I shall take up the countries in the order followed by Süssmilch, giving in the text a summary of his position and the evidence for it, and in footnotes my own comments and conclusions.

Portugal and Spain. According to Ustariz in 1723 Spain had 1,140,103 hearths, or families. Allowing five persons to a family, this would give a population of less than 6,000,000. After making reasonable additions for clergy, soldiers, beggars, etc., and for omissions in the count of hearths, Süssmilch could not reach a larger total than Ustariz; namely, 7,500,000. As Portugal was one third the size of Spain, Süssmilch assigned it one third of its population, or 10,000,000 for the whole peninsula.[1]

France. Both Botero and Nicolosi assigned to France 15,000,000; Riccioli, basing himself on reports from the French members of the Society of Jesus, put it at 20,000,000. An estimate published about 1700 A. D. in "L'Etat de la France" made

[1] Berg in his *Statistique Internationale*, published in 1875, gives the population of Spain in 1769 as 9,160,000. (J. Bertillon, *Statistique Internationale*, p. 31, note). Portugal at the beginning of the nineteenth century had about 28 per cent, and at the end of the century about 27 per cent of the population of Spain. If Berg's figures are correct, and this ratio between the population of the two countries held in the middle of the eighteenth century, the Spanish peninsula then had about 11,700,000 people instead of the 10,000,000 estimated by Süssmilch.

it 19,385,378. Vauban before the last war put it at 15,000,000 and after the war 13,000,000. Later and on more trustworthy evidence, Vauban estimated it at 19,094,000. A more recent anonymous writer whom Süssmilch thought trustworthy put the figure at 17,000,000, and this last figure was accepted.[1]

Great Britain and Ireland. Botero and Riccioli assigned it only 3,000,000. Chamberlayne gave England alone 5,000,000. King gave 5,500,000, and Derham accepted the latter's figures. In Ireland the people were enumerated at the time a *per capita* tax was imposed, and 1,034,102 were found. Scotland, being about the size of Ireland, was assigned 1,000,000. So Süssmilch accepted Struyck's figure of 8,000,000 for the United Kingdom.[2]

Netherlands. Struyck gave the population of the seven provinces at two and a third million and Süssmilch accepted the figure, adding an equal number for Austrian and French Netherlands, or 5,000,000 in all. Kerseboom gave much larger figures.[3]

Switzerland. Assuming that 200 persons live on each square mile, the standard density for agricultural countries, Switzerland would have 2,500,000 inhabitants. But the mountainous surface and the use of much of it for pasture make such an estimate valueless. If Switzerland could easily raise more than 200,000

[1] Levasseur, after a careful review of the evidence, was disposed to give weight to the estimate of the Abbé Expilly made about 1768, namely, 22,000,000, and gave as his own figures for 1715, 18,000,000, and for 1770, 24,500,000 inhabitants, which would indicate about 22,000,000 for 1750. *Population de la France,* vol. i, pp. 215, 216, 288.

[2] The *Census of England and Wales* for 1851 (vol. ii. sec. i, p. lxviii) estimated the population of that country in 1751 at 6,336,000. The population of Ireland in 1754 is given as 2,370,000 by the *Encyclopædia Britannica* on the basis of tax collectors' returns. The population of Scotland, "according to returns furnished by the clergy to Dr. Webster in 1755" and quoted by the same authority, was 1,250,000, making the population of the present United Kingdom at the middle of the eighteenth century nearly 10,000,000.

[3] Holland in 1795 had 1,880,000 inhabitants, and in 1839 it had 2,860,000. Assuming that its rate of increase between 1750 and 1795 was equal to that between 1795 and 1839, it had about 1,250,000 in 1750, and if Belgium then had the same, the two contained 2,500,000 people.

fighting men, as was often claimed, the entire population might be put at 1,000,000.

Italy. Riccioli assigned it 10,000,000 to 11,000,000, Botero and Nicolosi only 9,000,000, and Sabellicus only 7,000,000. Venetia had 494,325 houses in 1660, which multiplied by five would give a population of 2,471,625. The kingdom of Naples in 1556 had 483,478 hearths, which multiplied by five would give 2,417,390 inhabitants exclusive of priests, widows, prostitutes, beggars, and those citizens of Naples who were exempt from the hearth tax. Naples was assigned 360,000 exclusive of the persons in religious houses, but later, after the great plague of 1656, Riccioli gave Naples only 250,000. His figures would give the kingdom of Naples without Sicily about 3,000,000, and with Sicily, to which he assigns 1,500,000, 4,500,000 to 5,000,000. The States of the Church he assigned 2,500,000. Nothing is said regarding the population of other parts of Italy, notably Tuscany, but the population of the entire peninsula, with the adjacent islands, is put down at 10,000,000.[1]

Denmark and Norway. From a critical examination of the deaths and christenings reported for 1755 and 1756 A. D., multiplying the former by 36 and the latter by 27, Süssmilch reached the figure of 2,500,000 as an outside estimate.[2]

Sweden, Finland, and Lapland. Baron Haerlemann of Sweden gave this kingdom not more than 2,000,000 inhabitants, and Baron Flemming accepted his conclusion. Büsching raised the figure to 3,000,000, saying that there were 80,000 farms, each supporting 20 persons, or a total of 1,600,000, and that this was about half of the total population. Süssmilch accepted 2,500,000 as an outside figure.[3]

[1] The population living in 1770 upon the territory of the present kingdom of Italy has been estimated by Bertillon (*op. cit.* page 34) at 14,700,000, which would indicate a population in 1750 of about 14,000,000.

[2] Bertillon gives the population of these two countries in 1769 at 1,540,000, indicating that the figures of Süssmilch are about 1,000,000 too large.

[3] By adding the figures given by Bertillon for Finland in 1760, namely, 491,000, and for Sweden in 1763, namely, 1,940,000, to the number in all Lapland at the present day as reported in the *Britannica*, namely, 27,000,

Russia. In the wars before 1740 40,000 recruits a year were obtained by enrolling one from each 125 men capable of bearing arms. This would give 5,000,000 such male adults, or with the females 10,000,000. Adding 5,000,000 for those too young to bear arms or to marry and 2,000,000 for those over 56 years of age, Süssmilch reached 17,000,000. Adding two or three million for the classes not liable for military service and four million for the dependent tribes and peoples largely in Central Asia, a total of 24,000,000 resulted.[1]

Livonia and Courland. If this region were as densely settled as Alsace at the same date, it would contain 2,500,000. All the evidence indicated a less density, so an estimate of 2,000,000 was made, with the statement that it was probably too large.[2]

Poland and Lithuania. The meagre evidence indicated 12,000,000 as an outside estimate, a population which would result in a density about that of Spain and Portugal.[3]

Hungary had about one third the area of Poland and Lithuania and could not have much more than one third of its population, or 4,000,000.[4]

Turkey in Europe. All accounts indicated a very sparse population. On the assumption of 200 persons to a square mile,

a population of about 1,500,000 is reached, indicating that the figure of Süssmilch is about 1,000,000 too large.

[1] This figure exceeds by 5,000,000 that given for Russia in 1762 in the *Statesman's Year Book* for 1905.

[2] As the present population of these provinces of Russia is about 2,000,000, and as Livonia, the most populous, doubled its population between 1816 and 1897, it is probable that the estimate of Süssmilch is too large by at least 1,000,000.

[3] As the present population of Russian Poland, added to the Polish-speaking residents of Germany and Austria-Hungary, is less than 17,000,000, and that of Lithuania about 3,000,000, and as the population of Russian Poland in 1897 was 9,456,000, or nearly half that of the population then living in the old territory of Poland and Lithuania, and was 2,600,000 in 1815, one can hardly assign more than 6,000,000 to the entire area in 1815, and the most favorable assumption for 1750 would not give it a larger population.

[4] The imperfect census of 1720 gave 2,580,000. In 1787 9,400,000 were reported; or excluding the estimated population of Croatia and Sclavonia, 8,260,000. The mean of these figures indicates about 4,600,000.

the population would be 42,000,000. But it could not be one fourth of that. Süssmilch finally assumed 8,000,000.

Germany, including *Bohemia*, *Silesia*, and *Prussia*. This was the best cultivated and most populous part of Europe. With a density of 200 to a square mile, it would have 37,000,000 inhabitants; with one of 150, as Vauban assumed, it would have 28,000,000. Assuming it to have the same density of population as France, it would contain 23,000,000 inhabitants. Büsching's figure was 23,000,000. Süssmilch finally accepted 24,000,000.[1]

The total of these estimates and of my rough revision of them appears in the following table: —

Country.	Estimates of Süssmilch in Millions.	Figures that seem to me preferable.
Portugal and Spain	10	11.7
France	17	22.0
Great Britain and Ireland	8	10
Holland and Belgium	5	2.5
Switzerland	1	1
Italy, Sicily, and Sardinia	10	14
Denmark and Norway	2.5	1.5
Sweden, Finland, and Lapland	2.5	1.5
Russia	24	19
Livonia and Courland	2	1
Poland and Lithuania	12	6
Hungary	4	4.6
Turkey in Europe	8	8
Germany	24	23.1
Total	130	126

The evidence seems to warrant accepting Süssmilch's estimate of 130,000,000 as in error, probably, on the side of excess, and accepting any computations of increase from it as in error, probably, on the side of understatement.

[1] The population living in 1800 on what is now the German Empire was 24,500,000; in 1850 it was 35,400,000. At the same rate of increase it would have been about 17,000,000 in 1750. Adding 6,130,000 for the reported population in 1754 of what is now Austria, a total of 23,130,000 is reached, indicating that Süssmilch's figures are approximately correct.

APPENDIX II

The Population of China and its Increase since 1750.

Sources. The main authorities which have been used are: —

I. The Numerical Relations of the Population of China during the 4000 Years of its Historical Existence; or the Rise and Fall of the Chinese Population. By T. Sacharoff. Translated into English (probably from the German translation of the Russian original) by the Rev. W. Lobscheid. Hongkong, 1864.

II. The Manchus, or the Reigning Dynasty of China. Their Rise and Progress. By Rev. John Ross. Paisley, 1880.

III. Die Bevölkerung der Erde in the Ergänzungshefte to Petermann's Mittheilungen, 1872 to 1901. This work contains in various places figures and criticisms by Professors Behm, H. Wagner, and A. Supan.

IV. A Note on Some Statistics Regarding China. By E. H. Parker in the Journal of the Royal Statistical Society for 1899, vol. lxii, pp. 150–156.

V. China Past and Present. By E. H. Parker. London, 1903. Chapter ii.

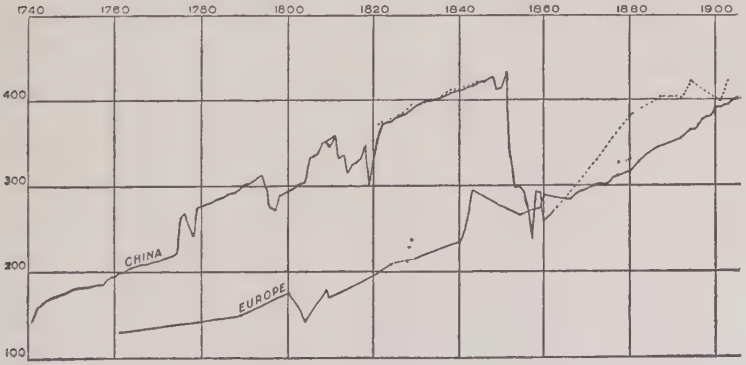
VI. Recensement de la Population de la Chine. By A. N. Kiaer in the Bulletin of the International Statistical Institute for 1905, vol. xv, part i, pp. 49–54.

It is noteworthy that the writers in number III make much use of I, but none of II or IV, while Professor Parker seems not to have seen I or III. Numbers I and II were found in the Library of Yale University.

According to Mr. Parker's statement, China has made each year since 1741, with a few exceptions due to special causes, a "return of all ages, castes, and sexes." These returns are found in an official Chinese publication recounting the acts of the government year by year. At the end of the section for each year are given the revenues and the population for the year. Mr. Parker has read each chapter in order to note "any casual remarks

upon population and revenue," and prepared a table giving the population of the empire reported for each year between 1741 and 1860 inclusive, except 1741, 1748, 1752, 1765, 1768, 1777, 1780, 1789, 1820, 1826, 1831, and 1834, a series of 108 returns in 120 years. Although in each of his publications he gives brief notes and explanations, he does not attempt any extended or thorough criticism of his figures.

According to a recent letter of Prince Chung, President of the Chinese Ministry of Foreign Affairs,[1] the registers of population of each district in China are sent annually to the finance minister, and embodied in a report to the emperor. There seems no reason to think that the alleged census of 1902 differed materially from any of the annual reports, the results of which are given by Mr. Parker. The general character of the series and the changes in population indicated by the figures are shown in the following diagram, on which the changes in the population of Europe during the same period (see Table I) are also given. I have added after 1860, distinguishing that part of the curves by a broken line, some later returns which were accepted by Mr. Parker or which seem probably to come from the same source.



Alleged Increase of Population in China compared with that in Europe.

These figures for China may be considered first on the assumption that they are approximately correct, and secondly with ref-

[1] International Statistical Institute, Bulletin, vol. xv, part i, p. 52.

erence to their trustworthiness. It will be noticed that the Chinese figures show much more marked fluctuations than those for Europe. The true curve for Europe would probably be far more regular and smooth than this indicates, most of the irregularities resulting from differences between the various authorities and not from actual irregularities in the increase.

Mr. Parker comments on the increase of 44,000,000 between 1774 and 1775 as follows: "A sudden and unexplained jump . . . which I can only guess is partly to be accounted for by the formal annexation of Turkestan, Kalmuckia, and Tibet; but all these together, including even Mongolia, Kokonor, and Manchuria, would scarcely account for 44,000,000 souls. I hope to elucidate the mystery some other time." An alternative explanation is given later. The great drop in 1794–97 is explained by Mr. Parker as due to "certain rebellions," and the fluctuations of 1810–1819 as the results of "the vagaries of the Yellow River." The great fall which began in 1852 is ascribed to the Taiping rebellion. He says: "In 1852 there was already a reduction of 100,000,000, and by 1860 a further reduction of 70,000,000. . . . This does not necessarily mean that 170,000,000 people perished in ten years, but probably that the anarchy prevailing rendered it impossible to secure any returns at all in devastated districts." This must be interpreted, apparently, as indicating that returns from certain provinces were lacking in the figures for 1859 and 1860 as well as in those for earlier years, although in the same author's extended table there is nothing to indicate it, and the natural inference from that source alone would be that the figures for the last two years were believed to be complete. The author, relying upon evidence from Chinese through Russian sources, concludes "that the present minimum population of China is not far from 385,000,000," and that the probable population in 1894 was about 422,000,000.

It should be noticed that Mr. Parker has not fallen in with Sacharoff's book or either translation of it, else he could not have written, "The Rev. J. Ross of Manchuria is the only European student who has, at least so far as I am aware, produced figures from ancient Chinese history indicating what the population was

supposed to be at a given date," and would have made some reference to Sacharoff's explanation of the sudden increase of population between 1774 and 1775, by which he was mystified. That explanation is that the emperor in 1775 "detected great negligence . . . in the compilation" and "issued an edict commanding that a census be taken in the most careful and reliable manner," whereupon "the authorities . . . invented another mode of compiling the lists by arbitrarily augmenting the figures representing the number of individuals." The average annual increase of the reported Chinese population between 1769 and 1774 was less than 2,000,000; that between 1774 and 1775 was 44,000,000. Rejecting these padded figures, Professor Supan estimates the population in 1776 on the hypothesis that the rate of annual increase in each province between 1771 and 1776 was equal to the average annual rate between 1749 and 1771. This method leads to a total of 219,000,000 instead of 267,000,000. Carrying this reduction through the period since 1776, Supan reduces the present figures for China from 394,000,000 to 346,000,000. He also gives a table showing the per cent of annual increase or decrease of each province between 1749 and 1894. For almost a century, 1749 to 1842, nearly every province showed a steady increase. In this part of Supan's table there are 160 cases of increase and only 2 of decrease. I cannot bring myself to believe that this corresponds to the facts. In British India and the native states between 1881 and 1901 there were 61 such cases, 48 showing an increase and 13 a decrease. In India 21 per cent of the cases showed a decrease; in China about 1 per cent. I am entirely unable to believe that China throughout a century and in every one of the eighteen provinces enjoyed such continuous and uniform prosperity as this would indicate. My conclusion from the internal and the external evidence is that no reliance can be placed upon the Chinese figures.

The preceding paragraphs, written before I had seen the first two authorities cited, find confirmation in those books. The opinion of Sacharoff is indicated in the following sentences: "The clerks think in general thus of the matter: the place is distant, the country large, the people a great multitude, my superior is

unable to discover an error or to ascertain the real number of the population. In accordance with this view they omit and add *ad libitum*, putting a large figure for a small and *vice versa* . . . . In this negligent and reckless way they carry on their work. . . . We need, therefore, not be surprised to find that all the registers are exhibiting great lack of veracity. Hence they are useless to the government and in the end altogether fictitious." That the translator shares in this severe judgment appears from the following sentences in his preface: "When the mandarins were no longer obliged to call more people to the performance of crown service or to remit a larger amount of taxes to the government, whatever the numerical strength of the population might be, they continued to add to the figures of former years *ad libitum* until, in spite of war, inundations, and epidemics, they had swelled the amount of the population to more than 412,000,000 souls. Not a single person who has traveled beyond the river valleys will believe that China contains 400,000,000 inhabitants."

Some confirmation of my opinion that the population of China has been increasing very slowly if at all during the last one hundred and fifty years may also be derived from the book by Mr. Ross. He ends his discussion of the population of China by writing: "In conclusion we may state our belief that the population of China proper is at the present day little if any greater than it was in 1753."

III

DEMOCRACY A NEW UNFOLDING OF HUMAN POWER

Robert Archey Woods

Methinks I see in my mind a noble and puissant nation rousing herself like a strong man after sleep, and shaking her invincible locks; methinks I see her as an eagle muing her mighty youth, and kindling her undazzled eyes at the full midday beam; purging and unscaling her long-abused sight at the fountain itself of heavenly radiance. — Milton.

It is recognized with increasing clearness by sober-minded men that during the ensuing century civilization is to be profoundly altered by further developments of the impulse of democracy. As a historic force affecting every aspect of life, its great past is not more than an introduction to its future. The underlying nature and the varied tendency of democracy as revealed at the present day must therefore be considered a momentous object of inquiry.

Democracy has always rested back upon a high and positive view of human nature and destiny. Omitting from consideration the so-called democracy of ancient times as having been merely a modified aristocratic system, we can see clearly that democracy found its motive in Christianity. In its developed modern aspect it takes its start from the Reformation, whose watchword "justification by faith" fitly expresses to the moral imagination the surpassing dignity of the individual human life. As taught by the French philosophers of the eighteenth century, democracy was distinctly Utopian, based upon a conviction of the perfectibility of human nature, and formulated in the

belief that it would introduce profound and all-embracing changes in the direction of a better social order.

As a revolutionary cause, directed at an old régime whose complicated structure of tradition, sanction, and authority was well-nigh impregnable against its principles and hopes, democracy was necessarily negative. The necessity of disintegrating the old order was so greatly emphasized that, for the time at least, everything was staked upon shattering its bonds. So intensely was this purpose followed that it became easy to believe that should these relentless barriers to the expansion of human life once be broken, life could then be easily trusted to its own inherent impulses. The abolition of monarchy would give to every man that personal detachment from the control of any other man which was implied in the teaching of the Reformation. The removal of fixed aristocratic privilege would furnish these new-made freemen with a life contest in which they would be no longer hopelessly handicapped because undeserved consideration had been lavished upon a favored few.

With the ground thus swept clear of the institutions that gave character to absolutism, and with liberty and equality established and maintained by a minimum degree of collective sanction, it was felt that by a series of spontaneous changes the relations of men would gradually seek the form of a great human brotherhood. In this country, on account of the revolutionary beginning of our government, and the necessity of a crystallized constitution in the early days of extreme administrative weakness, the theory became fastened upon our institutions and traditions that only such authority as is essential to personal liberty and to the preservation of equality before the law, may be intrusted to public administration. Because of the enormous expanse of the country and its well-nigh inexhaustible re-

sources, this scheme for the ordering of society with a modicum of administration and a very large measure of unrestraint was for some time satisfactory as being scientifically adapted to the precise situation. But in France, after the meaning of the Revolution and its results became apparent, some of the very men who had looked forward most ardently to the social progress which was to follow, came to realize fully that a scheme of administration pledged only to maintain the elements of freedom and fair play among individuals would go but a short and disappointing distance in developing the general industrial, intellectual, and moral well-being of the community and the nation. Social progress does not come of itself, any more than does maintenance of equal rights. It requires to be directed and promoted systematically and with intention. There is no side of human development which does not demand to have its available forces strongly grasped and consciously urged in the direction of complete fulfillment. The common weal involves the common will.

Not only is this true: as social relations become more complicated, if there is a large open sphere of life where the general outcome is left to that individual initiative which from the social point of view is nothing but haphazard, new and positively dangerous tendencies are soon set at work, — tendencies which not only gravely affect general social well-being, but actually threaten the strongholds of law and justice through which it is designed that liberty and equality shall be kept inviolate.

It is at this stage of democracy that every thoughtful person must admit the civilization of the world now stands, particularly in the more advanced countries. It begins to be realized that the final watchword of democracy, "fraternity," must be something more than a sentiment expressive of the moral state into which the community or

the nation is to come by the happy chance of balance among an infinity of self-assertive uncoördinated impulses. "The mechanical juxtapositions of individualism" do not lead to that constructive harmony which is presupposed in the last and greatest article in the democratic creed.

The maintenance of general liberty and equality is found to be possible in the first instance only through popular coöperation. A democratic government is simply a great coöperative society. In a fully developed civilization the spirit of coöperation becomes, in different forms and degrees, quite as essential for industry and culture as for political well-being. In fact, one form of applied fraternity, embodied in government, made possible liberty and equality; and this with the distinct purpose of securing the fulfillment of the fraternal motive of democracy in all other phases of human well-being. Under this motive, in these open spheres of life theoretically not trenched upon by administration, we begin to see quite clearly the necessity for large extensions of applied fraternity. These may come in any one of a great variety of forms of public or private collective action; let them take such form as experiment shall warrant, but come they must. It has well been said that the individual cannot dream himself into a character. The hope of early democracy that human beings would prove to be spontaneously democratic has proved to be pallid and inane as against the self-assertive forces which the open sphere of life leaves uncontrolled. Democracy destroyed the old social synthesis. It must itself create the new. Aggressive on the side of liberty and equality, it must become still more aggressive for effectual and comprehensive fraternity. Threatened with portentous dangers as a result of its great but ill-balanced service to civilization in the spread of liberty and equality,

it must and can ward off those dangers, and at the same time vastly increase its net total of achievement, by working out in determinate form its great principle of fraternity. The only cure for the evils of democracy is more democracy.

Thus we find that a system of ideas which has been narrowly conceived of as limited chiefly to the public ordering of the state, widens out so as to embrace the whole scope of life. For the twentieth century, democracy is not only a theory of politics; it is confidently invading the realms of industry, of education, of social intercourse, of ethics, and of religion. Under the democratic motive the whole history of civilization is being written anew, so as to set forth for every age and country the conditions and tendencies which have existed among the people as a whole, with a change of the historical perspective in each case so as to throw proper emphasis upon the part played by the previously ignored majority. It is more and more true, also, that working hypotheses for the future of civilization turn upon social aims which include all the human beings in a given community, on all sides of their lives, and in the exercise of collective choice and initiative.

It is of great importance to recognize the fact that democracy, in exercising its function of bringing a larger general fulfillment of their natures to the vast mass of men, does not content itself with existing resources. It is definitely an advanced system for increasing the net result of the productive labors of mankind. American slavery would have been overthrown economically by the competition of free labor had there not been a civil war. The democratic countries are the countries which are able vastly to develop their resources because they are democratic. Freedom and justice find their fruitage in strong and fresh

initiative. The democratic country can reward its workman far more liberally than despotism, and sell the products of its industry in competition with those of the despotic country, because the high incentive so increases the workman's productive power. The democratic country makes sound and steady increase in its population, both naturally and from without. The old régime regarded the alien as a probable conspirator against the sanctions of absolutism; democracy, confident of itself, welcomes him as a new disciple and producer. Thus the essential spirit of democracy, even in its elementary forms, is that of infectious creative enterprise. The economist, measuring the chief productive resources of a nation, places first free institutions.

The sum of all the enlargement given to life by democracy is found, however, in the right of association. Freedom and equality are more essential and more valuable at this point than at any other. The purely individual sort of liberty is not likely on any large scale to be seriously abridged, but the liberty to join one's life with other lives in many different ways can be more concretely dealt with and more surely minimized. Free association is in fact the chief secret of the large development of that personal initiative which flourishes under conditions of liberty. It is association that gives liberty its scope and zest. Some thinkers hold that reasoning is essentially a social process. Every form of intellectual advance depends infinitely more upon freedom of human association than upon free contact of the individual man with nature. Freedom of the press and of travel are simply aspects of the freedom of association. To the philosopher or investigator, they are simply links through which the fellowship of science is made strong and broad. Every individual pioneer in whatever realm of knowledge, how-

ever isolated he may seem, is simply one of a close-ranked corps.

The same thing is particularly true in the economic world. The promoter of trade is dependent for all but the least of his results upon the system of credit, which is simply the organizing for practical purposes of the spirit of human fellowship. Men trust one another in wider and wider reaches, until finally this system of trust in fellowmen circles the globe everywhere. It is through this subtle form of association that the bewildering achievements of modern commerce are worked out.

It is sometimes thought that the factory system with all its vast developments is due to certain mechanical inventions. But the spirit of invention was reinforced and made effective by the growing spirit of association; and above all, machinery is simply the appropriate tool of a type of industry organized by association.

The great principle upon which the modern factory system, and indeed the whole of modern civilization, is built, is that where two men work together, the total result of their labor is something more than it would have been if they had worked separately. The proportion of this surplus product grows greater as a larger number of workmen are properly associated. It increases the more rapidly as the work to be done is complicated and technical and is organized accordingly. The most effectual form of association is reached when an industry is so specialized that each workman can devote his whole skill to a single branch of it, but the work of all is dovetailed together in a general scheme. This secures a complete product which is usually of better quality, and is always many times greater in quantity, than would be possible to isolated workmen.

During the modern era the productivity of the human race has attained a vastly accelerated rate of progress. It

is, of course, out of the question to measure this gain with any sort of accuracy, but it is hardly possible to overestimate it. Mr. Gladstone once said that during the first half of the nineteenth century more wealth had been added to the world's store than had been added before that time since the dawn of history. He also said that during the third quarter of the nineteenth century as much wealth had been produced as in the first half. If we were not lost in the midst of this amazing development it would seem as if some magical change had been effected in the nature of civilized man. The usual explanations of it are entirely insufficient. The concrete, measurable element in the phenomenal gain which the race has made is chiefly ascribed to that side of intelligence which has to do with discovering the secrets of physical nature; and this too, with little regard to the fact that the discovery of these secrets, and the application of such discoveries, is only in small part an intellectual process of the individual. The profound truth is that the prime source of modern industrial progress is in human association. It is this force chiefly which has brought to light the mysteries of nature and has developed devices for manipulating physical forces. With these devices as tools, it has formed an ever more complicated system for drilling, disciplining, marshaling, and throwing into action organized masses of men, each mass being urged forward by a spirit, sometimes weak, sometimes overwhelming, of intelligence and achievement which goes with and belongs to the mass as such. It is association that has unimaginably developed the productiveness of the earth. We live not in the age of invention, but in the age of association. The great man of modern days is the man who understands this preëminently creative power.

A hundred years ago it was believed by economists that the human race was approaching the margin of subsist-

ence, — that the power of the earth to support a much larger number of people was a matter of extreme doubt. Meanwhile the race has developed in itself, as a race, a depth of productive resource which has placed the limit of subsistence ages away in the distance. By this development human well-being has been in the total considerably increased, and the people of civilized countries have had their lives definitely enlarged and enriched. The present movement of civilization is, it is true, accompanied by an element of social unrest, but this comes out of the hopes of the time rather than out of fears. It represents a conviction that, as vaguely understood social forces have already accomplished so much, they may, by the further adjustment of social relations, be led to achieve vastly more. In the main aspect this unrest stands for an extension of the principle of association beyond the lines up to which it is at present dominant. There is the feeling that, as applied to industry and culture, the proper all-around benefits of associated effort in the present and its greatest development for the future are hindered by the dominance of crude, unsocial motives. The ever-growing sense of the germinating and reduplicating energies which have their being and power in association, the very miracle of what has been accomplished through the extension of freedom and equality in association, is what gives indomitable force to the demand that through more association the conditions for the fulfillment of life shall be made still more equal and still more free.

On general principles, it would be supposed that in a civilization where government was by democracy there would be a strong tendency to create a system of democratic administration for industry and for culture as well. The inquiry arises whether democracy in its essence is not, equally with the old régime, a form of inclusive social

synthesis having its own peculiar authority and sanctions. It appears that the people by coöperation are carrying on the enormous business of government, and that this business in due time is much better administered in the interest of all concerned than under the old régime. Why, then, may it not be better from a practical point of view to extend this method further and further in the fields of industry and culture, in order that this more just and more productive form of social synthesis may have its way there as well as in the sphere of government? Democratic government secures the greatest liberty of the greatest number, not by chance, but by organization. The question is, therefore, whether in these other great fields of life the highest sum total of personal initiative and achievement may not be even more surely stimulated and given appropriate scope by a system which has been worked out with specific foresight to secure that result. The force of this inquiry is by no means exclusively directed towards the extension of a governmental régime to cover the vastly complicated interests of the economic and educational world. It is more and more clear that the principles of democracy may gradually be applied in these fields of life by voluntary effort and with a minimum of governmental interference. Whatever steps may in the future be taken in the direction of what is loosely called socialism, we need have little fear of the bugbear of a mechanical state socialism.

On the other hand, it is impossible not to observe the rapid strides with which the motive of democratic association has advanced in connection with the development of modern industry. At the beginning of the factory system, the workmen were at first dazed with its vast productiveness and with their own increase in material well-being. After a little, however, it was found that this system as

such was so powerful that many of the posts which had been filled by men could be filled by women, and a little later that women could even be displaced by children. In their alarm at what seemed to them the central and dominating factor in the new system, the machines, the workmen broke out in riots, and endeavored to destroy these inventions. They proposed to return to the old type of industry, in which the workman with tools of his own was an independent industrial factor. This effort was futile, because there was a great force behind the machine.

A generation later the workmen, with the help of humane teachers who combined practical experience with social instinct, learned that the force to be dealt with was not mechanical invention but the power of association. It was this which had created the factory system and made the mechanical inventions available. Curiously enough, when the workmen first began for their own protection to make use of this same force of association, the employers, the men who had gained the start in learning to understand and manipulate this force, seized with a sudden fear, undertook to destroy the trade union, just as the workmen had endeavored to destroy the machine. Recognizing that organized capital had behind it the force of social gravitation, the economists of the day reasoned that under the factory system, on account of the competition among applicants for employment, the wage of the workman must necessarily tend to decline to a point where it would be barely sufficient to maintain himself and his family. All efforts to check the action of this so-called economic law would, they held, be futile. It has now been clearly demonstrated that organized labor has the power of history behind it as distinctly as organized capital; that it represents to a greater or less extent a measure of con-

trol for the working man over the conduct of the factory system, particularly as it affects himself. The lesson of responsible collective action as the indispensable means of maintaining that standard of working-class life which is the substratum of civilization, has slowly and toilsomely been learned. As the principle of associated effort is applied by the employer more and more widely, the association of labor tends to parallel it: on the one hand, we have great business combinations covering whole countries and even reaching around the world; on the other hand, the labor movement is more and more effectively federated by nations and in friendly international alliances.

In Great Britain one fifth of the retail trade is carried on by cöoperative societies, which are complete economic embodiments of the principles of democracy. Against a development of this kind must be placed the great growth of trusts and similar combinations in this country. Yet it can hardly be denied that this very development has made the vast majority of the conservative people of the country seriously alert to the need of such democratic tendency in connection with industrial affairs as will exclude at least the extreme outcropping of oligarchic power over the supply of the means of subsistence. Partly for this reason, and partly because in the conflicts of associated capital and associated labor the interests of the consumer are sometimes grossly ignored, the spirit of association among consumers is rapidly growing. The natural way in which this spirit expresses itself, as everybody is a consumer, is through some form of public action. As the spirit develops, we may expect to see thorough organization of public sentiment for crystallizing in municipal, state, or national legislation the determined conviction that industrial organization must not produce grossly undemocratic

results. If this public demand is not effective in restricting extreme tendencies of existing forms of industrial administration, we must expect that it will undertake, in one way or another, definitely to organize on a democratic basis such parts of our great industry as prove to be not amenable to partial and restrictive action.

The main body of objection to this general tendency has to do with the vital importance of leadership. It is urged that the democratic form of business organization would not produce and afford full stimulus to higher forms of expert capacity and leadership. It is the most serious weakness of the democratic form of government that it has not yet learned sufficiently to trust the expert, the man who by heredity and training has the physical energy, intellectual grasp, and moral power effectively to handle groups and masses of men or to bring to light the hidden resources of nature. Administrative democracy is, in its early stages, a scheme of education rather than of efficiency. Its aim is first of all to bring on the whole mass of the people. The root of the matter is, democracy represents a strongly confirmed and ever spreading conviction that as the people are thus brought on, gradually laying hold on power proportionately to their newly elicited capacities, the average man proves equal to the political demands laid upon him, and makes a more alert and more loyal member of the community.

An essential aim of this popular training, however, must be to produce the readiness to trust capable leadership, and give it large scope for fresh initiative. Such a trust must insure the provision of ample opportunities and of ample incentives and rewards. But the very fullness of the provision to be made for the great men under democracy will raise the question whether democratic leaders and experts will desire or consent to be made

drunk with power; whether they will wish to be deprived of the reinforcement and uplift that comes of working in a group where all the others have opportunity and reward commensurate with their own. An increasingly democratic society will thus considerably change the standards of men as to what constitutes incentive.

It will also modify tests of expertness. In the effort toward municipal reform, for instance, it has been thought that it is only necessary to bring to the front men who are technically trustworthy and skillful in the round of administrative work in the different city departments. But the majority of the voters will not support this kind of reform. There are other candidates, not so expert technically, who from the popular point of view have a kind of expertness that is even more valuable. These candidates know the people and their needs; they see the great new demands which changed human conditions are placing upon the city administration. The majority of voters will inevitably, and, in the main rightly, trust this type of expert as contrasted with the other. The expert under democracy must combine with his technical skill a gift for anticipating the significance of a new want among the people at large as it ceases to be merely individual and sporadic and becomes common and public.

It has been an American tradition that our industrial and commercial arrangements have been such as to develop the best type of leadership. It is the current theory that great stakes are necessary in order to draw out a kind of ability which is assumed to be of extreme rarity; but recent experience is bringing a shade of doubt upon this conviction. It is by no means certain that great stakes attract the highest order of constructive genius. It is by no means certain that the continued possession of such great rewards is conducive to the best exercise of

such genius. There is abundant evidence in different civilized communities to show that where the high feeling of public responsibility obtains with regard to the supply of the universal utilities of life, capacity of the very first order can be developed and retained by a moderate degree of financial incentive. The question which is to be more and more seriously wrestled with is, whether the gains from free initiative in industry will not be vastly greater if there can be some sort of equitable distribution of scope for initiative among the entire number of the members of any particular industrial group. The ever-growing spirit of democracy among the rank and file of the people of the country, made strong and universal by all our institutions, and particularly by the public schools, is making it increasingly a matter of difficulty to organize an industrial force upon a merely autocratic or military basis. It is already found, in many lines of manufacture and trade, that a frank recognition of this spirit, and a definite provision for some form of participation on the part of the employees in the special profits of the business, and even in its administration, conduces to the removal of friction and to a greater degree of general coöperation and of individual productiveness.

Admitting, then, that a well-organized limited monarchy might furnish a more efficient form of administration than a newly developed democratic government, it is indisputable that the risks of democracy are a condition precedent to that enhanced industrial production — only partly democratic in its organization — which springs up so much more readily in a democratic state. The great productiveness of American industry is credited chiefly to our free government. If freedom in the political sphere can thus indirectly enhance industrial productivity, it is not unreasonable to suppose that this same force, if by

gradual experiments it is introduced into industrial organization, will still further increase industrial efficiency and the total industrial product. On the other hand, we now begin to realize that the upward tendency of government is considerably hampered by powerful influences for political demoralization which come out of the extreme oligarchic power common in our industry and commerce. In other words, our industrial organization is now threatening that political freedom which is the prime essential source of economic progress. There are not lacking judicially minded men who believe that a considerable increase in democratic standards for industrial organization is necessary to the protection, not only of democratic government, but of the elementary basis of our national industrial efficiency.

A doubt has already been suggested as to whether the existing so-called great industrial leadership is, for a fully developed civilization, really great, — whether there is not a very large negative element in its service to the community. Aside from this, it does not seem as if it could be seriously questioned that, with a proper system of education, the best form of productive genius could be developed for service in which enterprise and ambition would find its fulfillment in high achievement for social welfare, rather than in possession of vast power whose use is dependent solely upon one's personal caprice. Certainly there is such great leadership in professional and scientific occupations, and in the public service; and here the reward is found in the work done, and in social honor and power.

Even in industry itself there are very important tendencies that are working strongly towards the democratic type of leadership. As organized labor gains in strength and steadiness, and matches itself against organized cap-

ital, there is developed the permanent conciliation or contract system. Under this system a group of organized employers and another group of men representing organized labor combine into a general board, which serves to bring about, on an increasingly democratic basis, a higher form of organization for the industry as a whole. The success of the movement for distributive coöperation in Great Britain, which has already been referred to, is now being reinforced by the success of agricultural coöperation in different countries of the world. In the United States, — in the irrigation belt of the Southwest and also in the fruit-growing parts of California, — farmers combine to conduct their business on a large scale by coöperation. The great developments which are just ahead of us in the way of scientific agriculture, which will again considerably enhance the productivity of the earth, cannot be worked out by the autocratic or oligarchic system which prevails in general industry and commerce. These agricultural developments must, as a practical matter, be managed by coöperation. In the case of every type of industry that tends to become a monopoly, there is a constantly increasing likelihood that the community will undertake its regulation. In many cases, regulation being found insufficient, the community in one shape or other is undertaking the actual control and management of such industrial and commercial service. As the whole civilization of the world is one, an amazing amount of experimentation is going on in this direction, and as fast as one experiment becomes measurably successful its logic spreads from city to city and from country to country. This tendency for democratic governments to re-shape economic conditions is carried farthest in New Zealand, where it assumes a national scale, and is expressed in a highly efficient government, one of whose main objects is closely

to restrict extremes of wealth and poverty, and definitely to see to it that every citizen has, so far as it can be made possible, an equitable economic opportunity.

I have already suggested the large part which the educational motive is playing in this historic movement towards democratizing both industry and culture. The shortcomings of our national system of education from a searchingly democratic point of view must begin to be keenly realized. It is our boast that every child born on American soil has an opportunity to make the most of his inborn talents; but in saying this we overlook the increasingly serious fact that, particularly in our large cities, the majority of children are born amid conditions which are extremely prejudicial to their physical and moral growth. Nor do we appreciate the fact that the overwhelming majority of the children of a new generation — fully ninety per cent — receive no education beyond that of the grammar school, very many of course not receiving so much as that. Our public school system also, except for a negligible minority, provides no vocational training, so that nearly all of our young people enter upon their industrial careers mainly unprepared to apply their native powers. This is the more serious as the apprenticeship system has almost entirely passed away.

It has been a part of our easy optimism to believe that every youth with capacity will fight his way up into opportunity. Besides the large number whose capacity is smothered in infancy and early childhood by bad conditions, there is another very large proportion made up of those who, with excellent or unusual capacity of other sorts, do not have that quality of will power which enables them in their early years to overmaster all obstacles. This type of person is quite as valuable to the community as the one who, with a lower degree of other capabilities, has

exaggerated will power. It is not necessarily a satisfactory test of high serviceableness that an individual should have that extreme assertiveness of will which enables him easily to brush aside all material and social restraints.

From the point of view of national productivity, either directly through the present more or less autocratic business form of organization or through that presumably higher and more productive system which must be gradually developed by the extension of democratic principles, the existing educational scheme must, therefore, be seen to involve an enormous waste of personal power and social resource. The truly democratic educational system — and towards this we are in one way or another making headway— will provide that the children of our cities have such physical and moral surroundings and care as will bring it at least easily within reach of possibility that they shall grow up into healthy manhood and womanhood. It will furnish the sort of training which is designed to equip the rising generation as far as possible for its actual work in the world. The development of talent will be traced carefully as it expresses itself intellectually, industrially, and morally under the teacher's eyes. For each child that displays capacity, opportunities of education, however advanced, that will be appropriate to and commensurate with the young person's gifts, will be provided quite without regard to the merely accidental fact of the parents' economic or social condition. If it is admitted that a democratic community above all requires the development of the highest order of leadership, then there can be no way so promising of securing in each generation the maximum harvest of ability born into that generation as by the development of a truly democratic system of education. Professor Alfred Marshall, the greatest of English-speaking economists, estimates that not less than one half of

the best natural genius born into a country is born among the working people, and of this a great part is lost to itself and to the community on account of the lack of opportunity. He says that no form of national profligacy can be worse than this, and that there can be no more promising way of increasing national wealth than by providing, through whatever means may be necessary, for the proper care and thorough training of the whole of the potential genius that is born into each generation.

In education, then, we find a sphere in which absolutely without question the bold extension of democracy's equitable motive and comprehensive human grasp would enormously increase national production and national welfare. Through such a system the tendency towards caste would be broken. We should not in this or any other way come to a state of flat social equality; but undoubtedly a nation educated by a system thus scientifically and democratically devised would have a far narrower range of extremes of condition than exists at present. Such inequalities as would remain would be based upon actual facts of trained capacity free from favoritism, and expert service qualified, in most cases, by an instinctive acquaintance and sympathy with popular needs. Once the possibilities of democratic collectivism, including governmental action in different stages and the many forms of voluntary public-spirited organization, are fully worked out in the educational field, we shall see the power of democracy asserting itself more strongly than ever, in creating new and far greater resources for the enhancement of human well-being.

In this connection a most significant change is coming over the educated classes in general, in that every form of intelligence is more and more directed toward the human, and the broadly human, aspects of its particular field of

inquiry and interest. Learning is made up of the humanities in a new sense. Science, literature, painting, music, the drama are seeking, not only their proper material, but their proper constituency in the common life.

There is a close relation between democracy and cosmopolitanism. A system which has for its object, and on whose success depends the removal of misunderstanding, hatred, and friction within a community or a nation, of necessity gradually leads towards a removal of such barriers to human relations with other communities and nations. The most serious problem which has confronted democracy in the last fifty years has been whether its cohesive force is sufficient to hold together the people of a great nation presenting many different types and traditions and scattered over a wide extent of territory. By the complete establishment of a federal union in this country, it has been demonstrated to the world that such a democratic nation can exist. Its existence being assured, the further demonstration is now in process that a nation so made up has before it altogether unusual possibilities of development in economic and intellectual power. In fact, only under a democratic system could any such variety of racial types and groups as there are in this country be held together in a common unity while retaining a very large degree of social distinctness and special loyalty. In the different new groups are additional possibilities of the development of that varied personal economic and intellectual enterprise which is held as one of our most precious possessions. But such possibilities of sound individualism cannot be realized except by an increased degree of associated action of all sorts. We must determinedly make sure that none of these different types — whether on account of having arrived later on our soil than others, or on account of certain defects of their

qualities, or on account of stubborn remnants of racial or sectarian prejudice in them or in us — shall be deprived of full and appropriate opportunity of training and vocation.

There is needed thus in connection with the many new developments of associated action — they are sure to come, and the only question is how they shall be directed aright — a kind of social statesmanship which shall work, not only upon governmental administration, but upon our whole scheme of industrial and cultural organization. And this must be supported by a new patriotism, which shall minimize social sectionalism while giving due emphasis to all phases of the heredity and tradition of our different racial groups, shall work towards the full democratic development of education, and shall encourage all experiments towards gaining that large growth of industry which will come from the proper development and the equable distribution of individual scope and incentive.

Perhaps in the progress of this epochal movement we shall even have suggestion as to that further removed but still more radical and wonder-working transformation which will come about when the human race shall have learned to shape its course, not merely with reference to the lifetime of single generations, but with a view to generations of the future. The latest researches of science indicate that by far the surest and largest possibilities of the development of the human race lie in artificial selection. At present the problem of regulating the types which will be born into the coming generation by a proper selection of parents is in several respects almost entirely beyond human ken. The most that can be done in this direction under our available knowledge is to cut off as far as possible the continuation of obviously degenerate strains. It may be said, however, that a definite step will be taken towards proper selection in the interest of

future generations when by a truly democratic system of education all the most capable and educable ones, irrespective of artificial handicaps and all incidental conditions, shall be brought out together into the full light of intelligence and power. There will then be a distinctly greater likelihood of such voluntary selection as will raise the standard of humanity by considerably larger units of progress than any which present human resources could make possible.

In those fields of life which include the finer intercourse of the citizen of the world with his fellow-men, the rearing of new generations, and the striving toward the birth of a nobler human type, we may look with confidence to democratic association for prodigious achievements. That alliance of individual powers which makes them work toward the same end rather than at cross purposes, which develops a distinctive cumulative group energy through the well-proportioned union of ingredient capabilities, which kindles a common impulse of loyalty and adventure, will certainly not be less fruitful of results in the realm of culture than in the realm of industry. Indeed, the principle of free association is more dominant and productive as life is more complicated and refined. It finds greater possibilities of intelligent adjustment and of subtle, far-reaching alliances. It can organize that emancipated insight and foresight which fixes its gaze, not so much upon comparatively crystallized institutions intrenched by crude motives, as upon those interests which have to do largely with the dirigible forces of the future.

These considerations suggest the inherent moralizing effect of association. It has well been said that the moral law, to say the least, is the only practicable scheme of human intercourse. Every successful attempt to enlarge

human intercourse, to make it more varied, more resourceful, involves the bringing to the surface of nascent moral capabilities in the persons concerned. Democracy is first and last a scheme through which the individual has his moral nature enlarged by having new social responsibilities laid upon him. The citizen in a democracy must in due time develop convolutions in his brain which are not possible in the subject of an absolute monarchy. This is particularly true as democracy ripens from the rudimentary stages, when liberty and equality are overemphasized, into the stage when it is understood that it is fraternity which is the real touchstone of power and progress.

In any period of moral upheaval and transition there is, of course, the danger that some of the established fundamental and permanent foundations of morality will be somewhat ignored in the enthusiasm for the creation of new, advanced moral sanctions. The present period is no exception to the rule. This leads many conservative people to feel that the present invasion of our social system by democracy constitutes a grave moral danger. Such anxiety, however, has always been felt at every stage of history when the human race has marshaled itself morally for a forward movement. When one considers how deep and universal an upheaval has been involved thus far in the incoming of democracy, — how politics, industry, and religion have been revolutionized, — the remarkable fact is that the foundations of morality have been on the whole so little disturbed. For this there are several fundamental reasons. Democracy, not only in its institutions, but by its implications, involves nearly every one in a fuller, more obvious scheme of ethical constraint and incentive. As I have endeavored to show, every new stage of growth in democracy is accomplished through a more extensive and more intensive coördination, involving in concrete

fashion a double moralizing process for everybody concerned. What is also of great importance, the democratic movement in a great variety of ways and to a great variety of persons furnishes an inspiration which comes from a fresh outlet to the moral imagination. It turns many somewhat prosaic duties into opportunities which lie straight along the line of personal and social development, so that under the impulse of democracy we find many people not affected by conventional moral appeals who are moved to spontaneous renunciation for the sake of social service. Another exceedingly strong ethical factor in the democratic movement lies in the fact that it carries with it a reëstablished emphasis upon justice and the sterner side of the moral law generally. This corrects the too sentimental ethical tendencies which go with the type of enthusiasm that reaches optimistic views by limiting the range of responsibility.

The new morality of democracy is above all positive and actual. Under it the workman finds his path of duty in a great loyalty to his fellows, illuminated with clear hope of an enlargement of the means of life for the mass of men. The employer begins to see himself a social servant, bound to render service to society, not only in the proceeds of his industry, but in its processes as well, by doing justice to his employees and by making honest goods at a just price for the public. The professional man is moved to give his work a larger scope so as not only to include a proportion of charitable duties in a day's work, but to make the day's work as a whole advance the welfare of the community. This more positive result he achieves by bringing his work to bear upon some of the social causes which produce the problems with which he has to deal. The consumer, finding his life in its full economic setting, realizes that the thing which he demands

the manufacturer is compelled to produce, and that therefore it is his duty and opportunity to demand the results of honest work done under fair conditions, and produced under a kind of industrial administration that builds up the fabric of society rather than rends it asunder. In social intercourse there is an increasing motive which would prevent the restriction of acquaintance and friendship to a certain limited and select circle, and would give it a wider extension so as to include all sorts and conditions of men; because it is coming to be understood that every human being has something to learn from every other, and something to impart.

Thus democratic association is in itself a vast plasma of human interests. Instead of in any way restricting and hardening the issues of life, it provides to the vital impulse an infinitely varied number of natural, invigorating, inspiring outlets. It is simply a larger marking out of the possibilities of that higher type of personality which is developing through human evolution, an evolution which certainly is none the less natural and a part of nature because brought out through the action of the human mind. Productive as is the mind in these new collective instincts and relations when they act upon physical nature, it is certainly no less full of achievement and potency in the action and reaction of personalities upon one another, and in the development of the higher ethical — that is, the distinctively human — resources of the race.

Measuring the past history of the human race by the clear possibilities that lie before it, it may be said that it is now perhaps but rising out of its childhood. It is indeed only having the first dawnings of the consciousness of itself. It is emerging but a little from the inchoate, incoherent state in which its members have been under the

illusion that there was something for them in life apart from others and the whole of humanity. There are gleams of the higher social consciousness from which every impulse must fall away that does not rest in the oneness of mankind. As the race passes beyond its childhood into the lucid vision and compacted strength of its youth, the now distant hope of healthy, happy, noble life, in widest commonalty spread, may well become simply the real and satisfying business of daily existence.

Perhaps the surest ground of confidence that humanity is actually passing into this further stage of progress is found in the presence of a growing and spreading moral dynamic which is essentially new as a social phenomenon. There is, in fact, in the movement toward social democracy a peculiar sense of mystic power. It brings to the ordinary man that strange reassurance of the larger life which comes of itself through spending forth one's resources through channels of loyalty. There is that scattereth and yet increaseth. A large intensity of service and coöperation goes into every one of the bewildering maze of human groupings, and is followed by a greater recompense. Surely there never has been a time when so many men in the most frequented ways of life are finding that every wholesome overture of man to fellow-men is in itself twice blest.

It has been said that at the heart of democratic association, forming the source of its power, is the peculiar principle by which the whole is more than the sum of the parts. The output of two men working together is more than the total of what they produce separately. The combination of intelligence, the coalescence of wills, is in itself a third and compelling factor. This economic surplus value has its realizable and its realized counterpart in the relations of the inner life. Jesus said to his disciples, "Where two or

three are gathered together in my name, there am I in the midst of them." Bishop Westcott points out that this saying doubtless found some suggestion in the passage in the Talmud, "Where two friends are met together to study the law, the Shekinah comes and is present with them." A surplus value of the spirit, a power not ourselves, is evidenced in the process and in the result of every fresh extension of active fraternity toward the moral upbuilding of society. There is a religious meaning and power in association which is unwittingly experienced by vast numbers of men and women in these days as they go about their ordinary affairs, — a feeling of the reality, inevitableness, and fascination of service and fellowship; a kindling sense that now, in this day of association with all its potency and promise, is the crisis of the world. In any estimate of the present meaning of democracy, the road which it is to travel, and the length which it is to go, this religious afflatus — rising, vaguely understood, but soon to be overpowering — must be taken account of more deeply than anything else.

This new spirit, forming itself, as it were, upon the restless sea of humanity, will without doubt determine the future sense of God and destiny. The deistic conception of an age now completely past, that God is some distant monarch, will fade into the darkness with the social system which gave it rise; and society as a federal union, in which each individual and every form of human association shall find free and full scope for a more abundant life, will be the large figure from which is projected the conception of the God in whom we live and move and have our being. Under such a conception it will be found and felt that at every one of all the points in the never-ending complexity of human affairs where one life touches another, there is a sacra-

mental relationship which is being either reverenced or defiled.

The democratic religious motive carries also, as most vital to it, that hope and vision of the future which is essential to all true religion, that other-worldliness whose long perspective corrects and adjusts our foreshortened moral sense as to the many subtle ultra-rational ethical issues of our daily existence. The Utopia of democracy, in its true interpretation different in no principle from the Kingdom of God on earth, gathers up into itself all the great dreams which have illumined and fired the democratic prophets and martyrs, and constitutes in itself one of the deepest sources of power for making personality adequate to its present and confident of its future, and for bringing on the day when in large outline, at least, the moralization of human society shall be complete.

It adumbrates the coming of humanity into a transcendent realm of life, into a sphere beyond the region of competition; where each person's life is understood to be a thing of value to every other person; where the more any one has, the more every one has; where perfect freedom shall be found in a perfect equality of privilege, wrought out through perfect fraternity; where the individual will be in full knowledge and high purpose trained to exercise the complete vocation for which he was destined; and where each generation, by convinced and enlightened intention, will pass on blessing rather than curse to the succeeding race.

There goes with this ineffaceable spiritual ideal of democracy a triumphant consciousness distilled out of contemporary experience: that as humanity reaches upward and onward it finds itself to be apprehended of that which it would apprehend; that above and through and in the

power to which human nature has attained, there are vaster energies, working in affinities undreamed of, by avenues inconceivable, to sustain and relate all the protean diversities of being in a unity that grows toward omnipotence.

IV

AN ANALYSIS OF THE MORAL JUDGMENT

Frank Chapman Sharp

The purpose of this paper is to present an analysis of the process involved in the formation of the moral judgment. In the mind of the professional moralist this mental state is not always quite identical with what it is in the mind of the layman in philosophy. To the former it may carry all sorts of implications, accretions resulting from reflection upon the ultimate significance of morality and its place in the universal scheme of things. With this adventitious material we shall have nothing to do; neither its nature nor its truth concerns us in the least. Our study is psychological in aim and method, and its subject-matter is a certain mental process in the form which is common to all normal representatives of the race.

Descriptions of the moral judgment fall into two great classes, according as the consciousness of obligation or the feeling of approbation is conceived to be the ultimate source of moral distinctions. It is not the primary purpose of this paper to present an argument for either of these positions, for an honest argument would require a survey of the entire field of ethics. Instead of making any such futile attempt, I shall begin with the assumption that the feeling of approbation is the fundamental phenomenon of the moral life, and endeavor to exhibit the structure of the moral judgment as it appears when looked at from this point of view; leaving it to the course

of the inquiry itself to supply such evidence for the correctness of our starting-point as may naturally offer itself in the prosecution of the analysis.

It may be well to map out in advance the country through which we are to pass, as the road must wind, and we shall often be in danger of losing sight of the whole for the sake of which the part is surveyed. Our investigation, then, will fall into three divisions. We shall take up first the nature of moral approbation, seeking in particular to distinguish it from its genus, approbation. We shall then inquire whether the word "right" means anything more than that the conduct under review is capable of arousing moral approbation. Finally we shall analyze the consciousness of moral obligation, and seek to show its relation to moral approbation.

Moral approbation, we shall discover, differs from approbation in general, not in its emotional content, but in its object. This will be defined, in the end, though not quite exhaustively, as purposes, where purpose means the voluntary determination to bring into existence a certain state of things. But not all approbation of purposes, it will be shown, can be considered moral approbation. Approbation of a purpose can be classed as moral only when we approve of its adoption by every person similarly situated.

The determination of the nature of moral approbation is, however, only the first step towards the definition of the word right; for right, as used by common sense, means something more than conformity to the chance approbations of any and every individual. The application of this term to a given purpose must in the first place be consistent with its application to other purposes. Of two contradictory moral judgments, only one can be correctly designated as right. Thus, at its lowest, right stands for a

man's approbations as these are when they have been purged of all inconsistencies and are reduced to a harmonious system. But right seems to me more than this; it marks the approbations of a completely developed mind. Common sense assumes that the approbations of all men who meet these conditions will be in complete accord. Thus the moral judgment always intends to be of universal validity; it states not so much its author's spontaneous approbations as what he believes to be the approbations of those persons whose ideals of conduct form a consistent system and are at the same time the expression of a completely developed personality. Where this conception of the moral judgment is accepted, the facts of obligation will fall naturally into their place in the completed whole.

A word must also be said with regard to the method by which our conclusions are obtained. We are inquiring, it must be remembered, into the meaning of a term, not as it is used in some esoteric sense, but as it is employed in every-day life. And we must face the fact at the very outset that common sense uses it, as it uses cause, probability, self, and a thousand others, with at best an imperfect conception of its meaning. A certain portion of the connotation may, at any given time, be more or less distinctly apprehended; the rest will form an inchoate mass. The meaning is thus, for the most part, a matter of implicit apprehension, as Stout calls it. The fact is that "the centre of consciousness is not the centre of mental life;" and thus we may use with propriety terms which we should find it impossible to define. In such cases the method of direct analysis cannot be applied. We must gather the connotation from the denotation, the meaning from the use. Accordingly our immediate aim will be throughout to discover to what objects the adjectives right and wrong are applied, in order to extract by so doing the

meaning that is logically required to account for the observed facts.

I

The first object of our inquiry must be the nature of approbation and disapprobation. "To approve," we may say with Bradley,[1] "is to have an idea in which we feel satisfaction, and to have or to imagine the presence of this idea in existence." Approbation as thus defined evidently possesses both an intellectual and an emotional side, the two forming an organic whole, in which neither factor is at bottom more important than the other. Thus for the adherents of this view the old dispute, now fortunately tottering toward its well-earned grave, whether moral distinctions are grounded upon "reason" or "feeling," is a meaningless one. The separation of either from the other in the judgment of value would be equivalent to building a house out of bricks possessing mere form or mere matter. One fact and one alone makes the conception of approbation as a purely intellectual process plausible. The emotional element may at times fade from focal consciousness or disappear from the mind entirely. In such cases what we call approbation seems to be a belief that if certain conditions were not operating to destroy it I should feel the satisfaction in question. Such conditions might be: the removal of the object said to be approved from the perceptual world to the world of imagery, or from either to that of bare abstract ideas; the blunting of my powers of feeling through familiarity; the exhaustion of my emotional capacity through sickness or fatigue; the preoccupation of my mind by anxiety or suffering. It should be noted, however, that in all these cases the emotional element reappears or at least tends to reappear in the form of dissatisfaction the moment that

[1] *Appearance and Reality*, p. 408.

non-realization is threatened. Such an extension of the use of approbation is one that we must make for every word that signifies the existence of an emotion. Thus you may read in a letter written by Jacobi to certain old friends: "I am deeply convinced, my good friends, that I love you without ceasing; but I confess that at this moment I feel little of it, so cruelly have I been tortured to-day and yesterday" [by petty vexations]. We may believe accordingly that approbation, properly so called, is a state which includes as coördinate elements satisfaction and the idea of a state or object as existing.

Passing to the nature of moral approbation, there seems to be no discoverable difference on the emotional side between it and other forms of approbation. It may indeed be true, as has been urged, that every emotion changes in content somewhat according to the character of its object. If so, that will hold for the moral world also. But at most the change is not greater or more significant here than elsewhere, and it accordingly possesses no special theoretical importance. Certain difficulties that stand in the way of the acceptance of this statement may best be reserved for a later paragraph.

The differentia sought must accordingly lie in the nature of the object approved. This, as every one knows, is voluntary action. A voluntary act has three elements: (1) the volition or determination to bring about certain results; (2) the bodily movements in which this volition incorporates itself; and (3) the actual results which follow the movement. It is a commonplace that moral judgment is passed upon the first of these elements — the volition — and upon it alone. The volition, in its turn, is complex, containing (among other things) two elements that we are called upon to distinguish. There is, first, the determination to bring about a certain state. There

is, second, a set of convictions with regard to the nature of the situation in which the agent is about to act, the most important of which is the belief that a given course of action — the bodily movements and their consequences — will produce the results which it has been determined to bring about. The correctness of these convictions is sometimes dependent upon the will of the agent. He may, for example, use mistaken means merely because he does not care to take the trouble to collect the facts, or because he allows the "will to believe" to cloud his vision. On the other hand, after the will has done its utmost error may still remain. In this case the fault, if fault there be, lies with the intellect. Under such circumstances it is obvious that the blame which may attach to the person is not *moral* blame. If, for instance, the executor of an estate makes an investment in behalf of the heirs which, after he has used due diligence, appears to him a safe one, we do not accuse him of having committed a wrong, however badly it may turn out, even though another man of more ability or with more complete information could have seen from the first that disaster was inevitable. Moral judgment, then, concerns itself with only one of the elements in a volition, namely the end that the agent aims to bring about. The aim, of course, must be a genuine one. The vague idea that we might perhaps some time or other perform the action in question has, as we all know, little or no moral value. What we demand is the adoption of the end by the individual in such a fashion that action will inevitably follow unless prevented by circumstances outside of his control. This end, adopted and made its own by the self, we may call a purpose. Moral approbation differentiates itself from approbation in general in that it is directed to purposes.

In so far as this proposition has not met with unreserved acceptance it is because of certain facts which have given rise to the distinction between so-called formal and material rightness. These facts, however, when properly considered, do not justify us in supposing that we have two kinds of rightness on our hands. Let us examine, for instance, the conventional illustration, theological persecution. Many a black-hooded priest thought only of saving thousands from an eternal fire when he condemned some little knot of heretics to the flames that perish as they rise; or he took the existence of unorthodox opinions as evidence of secret corruption of heart, which as much deserved punishment as murder or treason. Obviously in so far as this description is correct the formal rightness which it represents differs in no way from rightness as already defined. A purpose has been adopted which cannot possibly be called other than moral. But his act, it will be urged, was "materially" wrong. What can this mean but that the situation was incorrectly viewed? The fault in him, if fault it was, lay in the intellect, assuming of course the exercise of proper care on his part in the formation of his conclusion, and the absence of impure motives that might cloud his vision. The case is thus an exact duplicate of the executor in the preceding paragraph, and the principle which applies to one accordingly applies to the other. You may call the conduct in both instances, if you will, materially wrong. But if you do, you must not fail to recognize that whereas wrong is originally and properly an adjective expressing moral blame, it is here used to mark condemnation of extra-moral factors.

The occasional denial, then, that the purpose, as here defined, is the sole object of the moral judgment turns out to be really little more than a verbal one. The same may

be said of the divergent answers given to the question: Is it the intention as a whole or the motives therein imbedded that determines the moral character of the purpose? If we will but ignore idiosyncrasies of terminology and penetrate to the thought that is seeking expression, we shall find, I believe, among living moralists complete harmony of opinion on this subject, at least as far as fundamentals are concerned. If by the intention of a voluntary act we agree to mean the totality of its foreseen consequences, and by motive, any end the thought of which tends to move to action, then we may assert that in the moral judgment the object of immediate consideration is the intention, — the intention in all its parts. But what we are ultimately concerned with is the motives disclosed in it; not merely, however, those that prevail and issue in action, but those also that, not having strength enough to determine the nature of the event, are suppressed and so fail to appear. As Bentham pointed out, when a man violates a trust, the motive, the prospect of gaining money, is innocent enough; the trouble lies in the fact that certain other motives failed to control it in this instance. The object of the moral judgment, in other words, is the system of a man's desires, in so far as they are called for by a given situation, considered in respect of their power to determine action.

On this point, then, contemporary students of ethics are apparently in entire accord. Their conclusion seems to me unassailable, as far as it goes. But if we would understand the actual movements of every-day judgments, we must make a distinction which the above formula ignores. We must distinguish, namely, between those desires whose object is a certain state as such, and those whose object is this state considered as a good. It is no more true that every voluntary act has as its motive the good

of self or another than it is that every such act is done for the pleasure it promises to afford. A man who (in the classic words of d'Alembert's foster-mother) makes himself miserable while he is alive in order that people may talk about him after he is dead, or a man who starves himself and endures cold and disease that he may save money enough to be buried in a grave of his own, is no more aiming at a state which when it arrives will be recognized as good than at one which will be recognized as pleasant. Similarly the person who insists upon interrupting our study in order to read us extracts from the newspaper in his hand is ordinarily not acting with a view to our good, nor is he aiming to attain a good for himself at the cost of our own; he is simply exploding. Nevertheless in every one of these cases the action may be voluntary. An idea, then, of a certain state whether of self or another or, apparently, of the material world about me, may arouse the desire for its realization, apart from any consideration of the benefit that will accrue to me or any one else from its realization. By the side of such desires exists that desire for our own good and for the good of others which, when it operates, makes us face the preceding class of desires with a *cui bono?* and tends to guide our actions with reference to the answer. Of course our desire for the good as such is not a desire for a content utterly apart from our other desires, something to be placed by the side of the desire to attend a concert, to be spoken well of by our friends, and to know something of the structure of the atom. On the contrary, it derives its whole content from these. It is, in a word, a desire for any state in so far as we believe it will be recognizable upon its attainment as a satisfactory state to be in. "Naught's had, all's spent, when our desire is got without content." This may be the cry, not merely of one who,

while possessing the shadow, has failed to grasp the substance because deceived in his estimates, but also of one who, fascinated by the former, has never stopped to give a thought to the latter.

It is to this second class of desires — which I shall designate as *criticised* — that common sense tends to confine its moral judgments, treating the non-criticised as non-moral. As far as it does so it conforms to the well-known principle that the object of the moral judgment is character. For character is not, as is often supposed, a mere name for the system of a man's desires. Whether he is or is not fond of power, or praise, or poetry, or an agricultural life, or the pleasures of the table, or the conversation of friends, does not determine his moral status. His character is exhibited in his attitude towards good and evil recognized as such. If any one doubts this statement, let him study the difficulties in which able men like Stephen and Alexander have involved themselves by ignoring this fact. Then let him examine with care the machinery with which it has been proposed to lift them out of the bog. Whoever will take the trouble to do this will, I believe, find himself forced to the conclusion that the definition proposed is the only one that will permit us to distinguish between mere tastes or temperament on the one hand and character on the other.

It must at once be confessed, however, that common sense does not hold fast consistently to the point of view that character, as thus conceived, is the sole object of the moral judgment. On the other hand, its procedure in this matter is not absolutely arbitrary. It follows — of course without explicit awareness of the fact — certain clearly definable laws. What these laws are it is impossible in this place to consider. That would involve an examination of the standards of approbation employed by com-

mon sense, and any proper presentation of this subject would carry us far beyond the bounds set for this paper. It must suffice for our present purpose if the object of the moral judgment has been so far formulated as to enable us to separate, even though incompletely, moral approbation from the larger phenomenon of approbation in general. And since we cannot carry the distinction out to the very end, I shall in the rest of the paper fall back to our first position, and speak of purposes as the object of the moral judgment.

Summarizing, then, we may assert that moral approbation is distinguished from approbation in general, not by its emotional quality, but by its object, and that this object is our purposes, or more definitely, the system of desires revealed in our purposes.

Many moralists seem to suppose the definition of moral approbation as that of which the object is a purpose, to be a sufficient one. It is, however, easy to show that this is not the case. If the lawyer for the defense makes a great effort to win the case against me, the lawyer for the plaintiff, I shall from one point of view disapprove his industry, his pertinacity, and his loyalty to his client, but I shall not for that reason consider them immoral. That is to say, an injury is not necessarily a wrong. Again, if a father steals so much money that he can give his son a liberal allowance, the son may possibly approve his father's actions, but no one would call that moral approbation. Similarly with regard to self. Every voluntary action is from some point of view approved by the agent, and is approved on the whole, under the conditions, at the moment of action, else were it not voluntary. Yet it is possible to do deliberately an act known at the time to be wrong.

The reason why such obvious facts are ever ignored is the existence of unduly simple notions of the nature of

the standards used by common sense. Thus "the greatest happiness of the greatest number" has been considered the actual standard used in every-day life for marking actions as right or wrong. If considered as the sole or even the prevailing standard, no idea could be more absurd. To say nothing of the moral judgments based upon criteria which have no necessary relation to welfare, as the æsthetic, most persons believe that it is the duty of a man to provide for his family first, even if the happiness of "the greatest number" is thereby considerably diminished. Objective morality, to be sure, may demand a quite different attitude. But the morality we are studying certainly contains any number of such judgments. Undue simplicity of definition is responsible for the same blindness in the case of another group of moralists, — those who hold that the standard used by common sense is always the true good of the agent. This account does as much violence to the facts as the former one. For the judgments of common sense consist, to an extent which no theory can afford to neglect, in a balancing against one another of what the agent believes to be the interests of a variety of persons having claims upon him of varying degrees of imperativeness, of which number the agent reckons himself to be but one. The significance of this fact is slurred over by the convenient assumption that the true good of all outside of self is consistent with the true good of the agent. But this assumption is of no avail, for — whether it be true or false — it is not usually made by common sense, as is witnessed by the most diverse facts, from the attitude taken towards the problem of Job to the arguments advanced for the necessity of a penal code. Our over-hasty moralists have simply assumed that common sense looks out upon the world of conduct through

the same glasses which they themselves wear; in other words, they have been guilty at bottom of the "psychologist's fallacy."

Wherein moral approbation differs from the one-sided approbation of the illustrations which introduced this discussion will appear if we note that what we consider right for one person, that we consider right for every one else under the same conditions. The conditions include, not merely the demands of the situation as they appear to the agent, but also ability on his part to meet these demands; ability itself including the time and physical energy at one's disposal, besides much else that requires no special mention. We call an aim right, accordingly, when we approve of every one adopting it under the same conditions; we call it wrong when we disapprove of any one adopting it under the conditions; and we consider it morally indifferent or innocent when we do not care whether people adopt it or not under the conditions. "Every one" of course includes self, though obviously in the case of self — and for that matter in the case of one's family and friends — other considerations may enter which make us disapprove it also.

The word "same" in the above formula should occasion no difficulty. It here means, of course, essentially the same, and this means that differences are irrelevant. If, for instance, it is an admitted aim of morality to preserve the conditions which make possible an industrial society founded upon personal property, then when opportunity offers to enrich one's self by forging a note, differences of need, to say nothing of differences of ability, will be held to be irrelevant. It should be noticed also that the formula as it stands leaves room for any amount of variety. When differences in needs, talents, tastes, personal relationships, etc., make us approve of different modes of

realizing the ideal, then it will demand different modes of activity. Thus the maxim, "Be unique, even as your Father in Heaven is unique," is capable of universalization as truly as the opposite and equally important one, "Fulfill without evasion those commonplace duties which are laid equally upon all men." We seem, then, to have reached a conclusion neither narrow nor empty when we declare right to be definable as that which the person judging approves of every one aiming at under the same conditions. In other words, moral approbation is differentiated from other forms of approbation by the fact (1) that it is directed to purposes, (2) that its grounds are such that they apply equally to any one and every one who may be called upon to act in the same situation.

Readers of "The Methods of Ethics" will recognize in our definition one of the three axioms which Professor Sidgwick believed could be used for the foundation of a renovated intuitionism.[1] When we consider the important place occupied in our actual judgments by the principle that "whatever action any of us judges to be right for himself he implicitly judges to be right for all similar persons under similar circumstances," we must conclude, I think, that but two alternatives are open: we must either, with Sidgwick, look upon it as an axiom intuited by reason, or as merely an account of what we mean by the term right. Those who have learned to be suspicious of intuitions in ethics will not find it difficult to choose between these alternatives.

Certain objections to our definition will readily occur to every one. It may be urged in the first place that we do not want any one to throw his money away, yet when others are not obviously injured thereby, common sense does not ordinarily consider it immoral. The answer is

[1] *The Methods of Ethics*, bk. iii, ch. xiii, sec. 3.

that common sense *does* tend to recognize, though somewhat hesitatingly and intermittently, a duty to self, and it is probable (though this, as far as I know, has never been demonstrated) that just those who are concerned at seeing a man waste his money are the persons who would consider it wrong. At all events we may say with much confidence that they would tend to do so, the tendency being prevented from becoming fact only by misunderstandings or by abstract thinking.

Again it may be argued that we do not want any one to air too much his own exploits, yet we can hardly go to the length of calling such exhibitions of vanity immoral. The clue to the proper answer is given by the words "exhibitions of vanity." There is of course nothing wrong — ordinarily at least — in the aim to make known your own exploits. But the emotion which prompts to the adoption of that aim is one which for obvious reasons we dislike. Thus the person criticised is disliked for a certain emotional endowment and not for the aim of his action, which, as long as it is not directed to humiliating his hearers, may well be innocent enough. The man, in a word, lacks "perfection," to use Alexander's term,[1] not morality.

Finally it may be objected that there are a great many offensive actions, such as sucking soup from the spoon, which we want no one to perform, but which we nevertheless should not think of considering wrong. The answer is plain. What I object to is the man's eating as he does in my presence, or at most in the presence of those to whom it is disgusting. And I do not blame the man unless I believe him aware that his action is or may be annoying or disgusting. In the latter case, however, he *is* an object of moral blame, — he has committed an offense against *la petite morale*. And if we should still

[1] *Moral Order and Progress*, p. 27.

disapprove of him, as some people would, if he were able to eat in this manner when quite alone, the object of our disapprobation would not be his desires, clearly not his criticised desires, — either those he has or those he lacks, — but his tastes.

The same principle holds for the case discussed by Dr. Johnson. Boswell having inquired what he thought of a bishop who went occasionally to a tavern to drink his wine, Dr. Johnson replied: "It is not immoral; neither would it be for him to whip a top in Grosvenor Square; [but] if he did I hope the boys would fall upon him and apply the whip to *him*. There are gradations in conduct; there is morality, decency, propriety."[1] A bishop who should whip his top in a public square would be criticised because he still enjoyed childish things. That is to say, he would be criticised for his tastes. And if a reprobation more serious should ever make itself felt, it would be directed against the implied weakness of will or perhaps the carelessness as to his influence involved in the pursuit of amusements which were bound to call forth the criticism of his fellow-citizens. In themselves considered, then, judgments of decency and propriety, even when universal, lie outside of morality because directed upon an object other than purposes.

We may summarize the results thus far obtained as follows: Moral approbation is simply approbation, as defined on page 104, directed to certain purposes or aims. A purpose is morally approved when it is such that, placing ourselves in imagination in a social order large or small, we wish every member to make it his own under the given conditions.

It may be useful to compare this definition with some others which share its assumption with regard to the fun-

[1] Boswell's *Life of Johnson*, Hill's edition, vol. iv, p. 87.

damental place of approbation in the moral judgment. The first may be formulated so as to read, Right is that which every one wants. This definition, however, is ambiguous. It may mean, in the first place, Right is a name for that conduct which I like and which at the same time I find every one else within the range of my mental vision likes. This view seems easy to refute. For if there is anything certain in this subject of ethics it is that, while I may hesitate to pronounce an action right, just as I may hesitate to pronounce a statement true, until I have discovered what attitude others take toward it, nevertheless this attitude on the part of others no more enters into the meaning of the term in the first case than in the second. Take the question now much debated in the newspapers, May a man with cancer hasten his death by poison? Answer it either way you please. It will still remain true that when you judge one course or the other right you are not registering a guess as to what every one, or the majority, wants done in the premises. Otherwise its rightness could be settled by a referendum. But in the second place the definition of right as that which every one wants may mean, as it does, for instance, with Clifford, Right conduct is such action as would be profitable to, in the sense of serving the egoistic interests of, every one beside the agent. This theory seems to me to stand in almost as glaring contradiction to plain facts as the preceding one. For every moral judgment of common sense, with only most sporadic and easily explainable exceptions, permits some scope to the interests — I mean the egoistic interests — of the agent himself. Indeed the entire tendency of common sense is decidedly in the direction of granting them too much rather than too little consideration. And when the boundary line has been crossed that separates the permissible from the for-

bidden, it is not from the selfish that condemnation first comes, even when their own interests are deeply affected. They may indeed express resentment, as an autocrat may strike the bearer of bad news. But the guilty do not necessarily fall in their estimation. It is primarily the unselfish that blame the selfish. This is well shown in the following account of the after-effects of a big mining swindle in a Nevada mining camp: "Once more the multitude had been duped and fleeced, once more the few emerged gorged with iniquitous gains. But though curses loud and deep were showered upon the heads of the successful swindlers, they lost no caste by what they had done. How could they, indeed, when every man felt in his heart that he would have played the same game had he held the same cards?"[1] Every reader will remember the reception given to Mr. Croker's words, "Working for my pocket? Of course I am, all the time, just the same as you." I conclude, then, that neither interpretation of the formula under discussion can be accepted. And I am inclined to attribute such vogue as it at present enjoys to the ambiguities which throw a mantle over its failings.

A second definition is often met among those who look upon approbation as the source of moral distinctions. According to it, right is not so much what every one wants as what I want most. If this definition were correct we should find right used by many persons as an adjective not of purposes but of intellectual, temperamental, or other characteristics of personality. For it is certain that not every one looks upon morality as the most important element of life. Countless numbers of persons, in their heart of hearts, would rather be clever than upright, would rather have their children grow up shrewd than good, and would rather live in a bad than in a stupid

[1] G. T. Parsons in the *Atlantic*, vol. xl, p. 159.

community. The thing which most attracts them is intellectual strength. Others, again, are like Flaubert, for whom there was "nothing in the world except beautiful verses, well turned, harmonious, resonant phrases, glorious sunsets, moonlight, paintings, antique marbles, and shapely heads. Beyond that, nothing." Yet these persons use the terms right and wrong in exactly the same sense that every one else does. Nor does right mean what the majority care most about. An entire society, like that of the Italian Renaissance, may lose to a very considerable degree its sense for moral values, while yet the meaning of right remains the same for them that it is for others. Nor can we conceive of any shifting in our sense of values that should set us calling stupidity wrong. There are as a matter of fact many personal excellences (ἀρεταί) which are the object of approbation, — intellectual excellences, temperamental excellences, excellences of taste, and excellences of character. To the exhibition of these last we give the name moral; and we shall continue to do so while the language remains what it is, without plaguing ourselves with the inquiry as to which set of excellences is most valued by the majority or by ourselves. To say that they are called moral because important is like saying that the city whose centre is the Island of Manhattan is called New York because it is the commercial metropolis of the United States.

The same error lies at the foundation of both of the preceding definitions. They rest upon the failure to keep clearly in mind what the object of the moral judgment is. This, as we have seen, is everywhere acknowledged to be not results but purposes. Yet because of the ambiguities of every-day speech, taken up as they are into many moral systems by the adoption of the terminology, formal and material rightness, this point of view is often difficult to

keep before the attention. As long as results are thought of as the object of moral evaluation, either of the preceding definitions possesses a certain plausibility. It might be alleged, for instance, that even the most narrow-minded worshiper of cleverness wants his banker to keep his hands off the money intrusted to his care, more than he wants anything else in the world. Even if we granted this, however, for the sake of argument, it would avail nothing. For the question is, not what value does he attach to this or that result, but what value does he attach to character? and if he does not value this above everything else, does he apply the adjectives right and wrong to other things than its exhibitions?

On an entirely different footing, as it seems to me, stands the famous definition of Adam Smith, according to which moral approbation is the approbation of the impartial spectator. At all events, interpreted in a certain way, it does not differ fundamentally from my own. I must now attempt to show why I prefer the formula I have proposed to that which carries with it the prestige of his great name.

In the first place, it is in no mere spirit of carping criticism that I reject the term "spectator," together with its implications. In Adam Smith's theory the term is an appropriate one. According to him the moral endowment of man consists in the capacity to mirror, more or less perfectly, the pleasures, the pains, and the emotions of others, together with an enjoyment in the perceived similarity between the object reflected and its reflection in the mind. What he calls moral approbation is the pleasure arising from the discovery of a similarity between these various images and their corresponding objects. But no theory for which this conception is not fundamental can consider the term spectator an adequate expression of

the facts. This appears most conclusively when it is applied to self-judgment. Self-judgment, for him, must involve a mirroring of the picture contained in the mirror which is reflecting our conduct. For a theory like the one which is here presented moral self-criticism is a very different affair. We find in ourselves certain ideals the universal adoption of which we desire. When we act according to their dictates we morally approve our own acts. Of course we cannot approve without seeing, or rather knowing, the thing that we approve. But the seeing, in the present theory, is not the characteristic feature. At most the moral judgment could be defined as the judgment of the impartial approver.

The impartiality, in its turn, is of a special kind, which requires more exact definition. Some forms of partiality are admitted by common sense as perfectly legitimate under certain circumstances. In matters of "benevolence" many of its best representatives — though by no means all — believe that a man owes more to his family than to strangers; many that he owes a greater duty to himself than to any one else. On the other hand in such matters as respect for promises, for the truth, for property, no such distinction is commonly made. The impartiality demanded of the moral judge is rather to be defined as consistency. Yet consistency in itself is no solution, for there can be no such thing except as there is some principle which is to be carried out without contradiction. This principle is no other than that already quoted: "Whatever action any of us judges to be right for himself he implicitly judges to be right for all similar persons under similar circumstances.[1] The nature of the principle, and with it the kind of impartiality demanded, seems to find its most adequate expression in the formula which I have offered.

[1] See above, p. 113.

There is a third objection to Adam Smith's definition. In his own theory the impartial spectator occupies a natural and legitimate place. We see how he came there. But in the theories of those who reject most of Smith's premises while retaining his definition of moral approbation, the impartial spectator seems to have no logical standing-room. He does not seem to be a necessary or even a natural consequence of the premises with which we started. He drops down upon the stage like a *deus ex machina*. I venture to think our own formula avoids this difficulty. We start with the assertion that we have, in the beginning, certain desires. We see some persons actuated by these desires, others not. In time the question, What desires do I wish should rule universally under any given set of conditions? cannot but present itself to the mind. When it is answered, we have formed a moral judgment. The moral judgment thus follows necessarily from the fact that we have desires which concern themselves with human purposes.

The scope of this criticism should not be misunderstood. The definition rejected points to a very important truth, a truth often ignored in these latter days. Moral approbation, it may teach us, differs from other approbation of purposes in that it is approbation abstracted from the accidental relation of the conduct in question to self, whether as agent or patient. He who accepts Adam Smith's theory of the moral sentiments in its essentials will find in the term "impartial spectator" an adequate expression of this fact. But those who reject the greater part of the theory, as apparently we all do to-day, in adopting this phrase make the mistake of those who pour new wine into old bottles.

Before leaving the subject of the nature of moral approbation and disapprobation, a few words must be added

about their normal accompaniment, moral thankfulness and indignation. Fusing with the emotions that give them life, these highly flavored condiments produce, when present in their complete potency, a whole that differs in quality so markedly from the bare satisfaction or dissatisfaction itself that we cannot be surprised when some moralists treat the resultant as a unique emotion. It is these emotions also that are largely responsible for the warmth of our feeling towards the good and the bad man respectively, and tempt us at times to agree wholly with Schiller's maxim, "Base men pay with what they do, good men with what they are." Evidently no account of the moral judgment is complete that omits these elements from its description.

The pedigree of moral thankfulness and indignation is worthy of a moment's attention. There can be no question, it seems to me, that they do not differ in nature from the gratitude and resentment that tend to follow all approbation and disapprobation, indeed all pleasurable and painful states, whether their exciting cause be conscious beings or inanimate objects. They are indeed often treated as the primary phenomena, and the outgoings of gratitude and resentment on the lower plane are explained as the result of a process of personification. But this does not account for the fact that an adult, a member of a civilized race, in full possession of all his faculties, may give his knotted fish-line a vicious jerk, or kick the door that slams in his face. The tendency of resentment and gratitude to rise on our being displeased or pleased seems to be an ultimate characteristic of mind, and the real problem therefore is, How do some of us come to confine them as successfully as we do to the volitional element in the life of conscious beings?

If our position be true, these pungent emotions which,

fusing with the satisfaction or dissatisfaction from which they spring, give them most of their character and much of their motive force, do not rise miraculously when the mind first takes note of the character of volitions; they are the normal accompaniments of approbation from the beginning. Furthermore, intense and voluminous though they be, and capable thus of submerging the individuality of that to which they owe their life, they are nevertheless parasitic in nature. This fact is overlooked by those who, like Westermarck, make moral indignation and thankfulness the fundamental phenomena of the moral life. Such writers begin to build their ethical theories at the second story.

We have attempted thus far to exhibit two facts: (1) the nature of the emotion of moral approbation, and (2), in so far as was necessary for our purpose, the nature of the object which calls it forth. In so doing we have but completed the first half of our task. It remains to assign to moral approbation its place in the connotation of the word right.

II

Many of those who look upon moral approbation as the fundamental fact of the moral life hold that right means nothing more than the conduct of which I approve; and this has been heralded by friend and foe alike as the only possible outcome of such a view. But however completely we may seem to be shut up to that conclusion, this is assuredly not the meaning which common sense attaches to the term. In the controversies about social and political rights, as, for example, concerning the limits of freedom of contract, the right of a man to do what he wills with "his own," the right of self-government, the existence of moral claims as between nations, the discussion does not

aim to bring out what the parties to the controversy like; it seeks to discover what is right. And in such matters as the extent of the fundamental rights and duties the question is not resolvable into one concerning the means of reaching an end accepted by all parties to the controversy. The proposal of certain socialists to get rid of the English debt by repudiation, or of the followers of Henry George that the government should take possession of the land without compensating its present owners for the "unearned increment," — these are indeed sometimes discussed on the basis of what will pay the majority of the community in the long run. But the question of the validity of rival claims is always at bottom a matter of ends, not means; and the assumption that there is something which is right in these things, whatever may be the likes of reader or writer, pervades all serious discussions of such problems. The same truth holds for the sphere of so-called private morality. What is the duty of a man who is compelled to choose between the life of his child who is playing upon the track in front of his house and the lives of hundreds of passengers in a train rushing towards an open switch? May a man revenge himself upon one who has destroyed his home, or made him a beggar by wrecking his business? Here again are questions of principle, not of means to an accepted end. When a man declares one or the other of these alternatives right, he means something more than that the alternative in question is one he would prefer to see chosen. If easily aroused to indignation by the sight of suffering caused by greed, he may perhaps be heard to say, I hope the victim will revenge himself, though I admit I do not think revenge is right. If he finds his neighbor preferring the course opposite to that which he approves, he does not think of declaring both to be right.

Indeed the fact that common sense uses the word right to mean something more than its actual approbations is so obvious that it can be denied only by those who, for one reason or another, hold that nothing can be found corresponding to such a conception. In the face of this prepossession I can only insist that even if the premise be true the conclusion does not follow. And the premise itself ought not to be granted till every other alternative has been shown to end in a blind alley. It may be worth our while, then, since we have been forced into this ancient controversy, to inquire whether any meaning can be attached to the word right as used every day by common sense.

As heretofore, our method of investigation will consist in nothing more recondite than a careful scrutiny of the meaning of the word under consideration as this appears from its use. We may start from a fact about which there can be no dispute. At its lowest, right means for common sense not my approbations as they stand, but these approbations as they would be if purged of all inconsistencies and reduced to a harmonious system. Give a number of persons the question, Should a father, compelled to choose between the life of his child and the lives of a train-load of people, save the latter? Give the same persons the question discussed by Grotius, "May an innocent citizen be delivered into the hands of the enemy in order to save the state or the city?" You will find some who answer "Yes" to the first and "No" to the second. Ask these whether both answers can be correct. They will of course reply — as every one knows who is not blinded by preconceived theories — either that there is a difference between the two cases, or else that one of their answers is incorrect.

Inconsistencies in moral judgments may be due to sev-

eral causes. The most obvious is the influence of passing moods. After a good dinner, eaten in company with agreeable friends, a man, feeling at peace with the whole world, might think with satisfaction of loving all his fellow-men, including even his worst enemies. The next day, hungry and tired and harassed by a variety of vexations and disappointments, he might repudiate the bare suggestion of such a possibility. A second cause is the blinding influence of habitual modes of thought or feeling, of prejudice, and of self-love. For of all forms of love, self-love is most completely blind. King David killed his loyal subject, Uriah, and took Bathsheba to be his wife, without a qualm. But when the prophet told him the story of the rich man and his poor neighbor, the scales fell from his eyes, and he saw he had done what he otherwise abhorred. In all such cases what a man considers his *moral* judgment is, at the lowest count, the expression of his deepest, most firmly rooted approbations.

The dull insensibility produced by habit, or custom, or any of the other of life's narcotics, may be destroyed when we either see or, for any reason, become able to realize in imagination the outgoings of our purposes in the lives of others. Mr. Alfred Russel Wallace writes that he used to shoot monkeys with no more feeling than if he were shooting at a target, till one day he witnessed the grief of a mother monkey as she held in her arms the dead body of her child killed by him. Thereafter every monkey was safe from his gun. Similarly a man has been known to oppress remorselessly the poor until circumstances forced him into some close relation with the lives of certain of his victims. Thereupon what was once done without compunction became intolerable. Evidently each of these men in the presence of a new situation formed a new moral judgment that became a permanent part of the

furniture of the mind. Certain latent capacities for feeling were aroused in them, of the existence of which they had hitherto not dreamed. Had they, however, before these incidents, been permitted to look into the future, I believe they would have considered the judgments of the present self, with its recognized narrowness of vision and dullness of feeling, erroneous in comparison with those of the more highly developed self. If so, right means not the harmonized approbations of my surface self, so to speak; it means rather the consistent system of my approbations when all my capacities and latent powers have been developed to their maximum. When a man, after the fashion of most men, declares conduct right or wrong according to the ideals of his present and often superficial self, this is not because, for him, right means that which fits into the system of his actual approbations, but because he supposes no further development could make him look at and feel about the facts in an essentially different way.

So far, then, it seems to me, we can proceed with security; and at all events, as far as we go we are unencumbered with assumptions. We have been simply analyzing the shape that our approbations must take before we apply to their object the adjective right. The further position, however, that right is something which is valid for every one, involves the assumption that when all men have reached complete development and have reduced their moral judgments to a consistent system, these judgments will agree. That common sense does implicitly make this assumption has already been asserted. We find people (if I may repeat) engaging in controversy upon matters of principle, as well as upon the application of mutually accepted principles. This controversy takes the form, to a great extent, of pointing out contradictions in the judgments of the

opponent; or it asserts that if circumstances had awakened the mind to the realization of certain facts the attitude under criticism would have been an entirely different one. Throughout the argument it is taken for granted that an agreement between the parties to the controversy is possible, or at least would be possible if they could but meet with the same experiences.

The question whether the mind of man can be made to yield a harmonious system of moral approbations in the manner suggested is irrelevant to a strictly psychological inquiry. For this reason, and for other reasons equally good, I do not mean to consider it in this place. One objection, however, demands consideration, since to ignore it might prejudice the entire case. Criminal psychology seems to have established the existence of a type of man which it calls the moral imbecile. The extreme representative of this type feels no remorse for his own past crimes, however monstrous, and looks with equanimity upon the commission of future ones. He may rage like a wild beast at those who injure him; but he rages impartially at his fellow criminal who sells him out and at the humane judge who gives him every opportunity to clear himself if he can. For neither party does he feel moral condemnation; the man who betrays him does not sink in his eyes. The approbations of these monsters are singularly consistent, and they apparently have no latent powers that experience could awaken or develop. Are not their judgments upon conduct, then, according to our description, entitled to the name of the objectively right? The answer is simple. Not all approbation directed to purposes is moral approbation. We enter the sphere of morality when we become capable of condemning or approving conduct in its universal aspects, when, as has been said above, we have ideals that concern

themselves with the purposes of all who are placed in a given situation. Such approbations the moral imbecile does not possess; in their place is blank indifference as to what the world does, except as his egoistic interests are directly affected. His judgments accordingly are not even moral; much less can they be called objectively moral. If, then, the moral judgments of men are to be woven into a harmonious whole, the men must be able to contribute *moral* judgments to serve as material out of which to work up the completed fabric.

A further question is sure to be raised: Can the solution of the problem of objectivity here offered hope to find favor with those moralists who have most vigorously insisted in the past upon such objectivity? Will it satisfy their needs as their own theories appear to have done? While, in my opinion, any reply that may be offered cannot affect the truth of the previous account, yet since the question itself is both legitimate and important, it may well receive a moment's attention.

In the first place, then, consistency is universally valued, not perhaps as an end in itself, but as a means and as a sign. As the natural and necessary outcome of an all-sided development it stands for intellectual, volitional, or other perfection. As the condition of the attainment of any complex end it will be valued even by the most prosaic and the most stupid. Hence in so far as a man can be made to see things as they are he must despise himself for living on the lower planes of conduct, because this means that what he builds up with one hand he is tearing down with the other. He who throughout acts objectively right is simply one who possesses the continuity of purpose indispensable for the attainment of any definite goal.

Moreover the direction of the desires of the completely

developed man, who is the ultimate standard, is no matter of indifference to his less advanced neighbor; on the contrary it is something which may have a very important effect upon both his feelings and his conduct. For there exists an element in human nature which, while Kant would undoubtedly call it accidental, is at all events universal or well-nigh universal in extent. This is the desire to possess all the powers and capabilities of the race, and the corresponding admiration for men in proportion as they possess them. For this reason, as soon as we discover that certain feelings and attitudes are the necessary result of any of these powers, such feelings and attitudes begin to command our respect. We are pleased to find traces of them in ourselves, and tend to feel ashamed when they fail to appear. Just in so far, then, as the morally callous realize their relation to the morally developed they are in just that position with reference to objective rightness that Kant wished them to be. Even though in action recalcitrant, they feel the wish to be able to conform to its dictates; they look up to it with reverence; they are constrained to characterize it in their secret thoughts as the more excellent way.

We are now ready for our final definition. Right and wrong are adjectives applied to the system of a man's desires as these exhibit themselves in relation to the demands of the situation. We might almost replace this last by "the system of his criticised desires;" but common sense does not stick to this point of view quite consistently, and we may not simplify our formula by smoothing out the facts. Right furthermore applies to desire in what we may call its universal aspect; it marks an approbation the grounds of which will hold, in the opinion of the person judging, for every one under the same conditions. Yet not every one's approbation entitles a

given embodiment of desire (the purpose) to the designation right. Right marks the approbations of the man whose ideals of conduct form a consistent system and are at the same time the expression of a completely developed personality.

III

The foregoing definition will appear to have omitted all reference to what for many persons is the most characteristic feature of the moral judgment; namely, the sense of obligation which it is capable of awakening when its findings are applied to our own conduct. It therefore remains for me to exhibit what I conceive to be the relation of obligation to approbation, and to show that after all a place has been left for the former in our definition.

The characteristic element in the consciousness of obligation appears to me to be emotional in nature. Certainly those writers who have argued most persuasively for its assimilation with the intellectual factors of the mind have reached their conclusion by asserting at once the objectivity of moral distinctions and the impossibility of obtaining such objectivity from approbation. As has been seen, while accepting the former I reject the latter position. With its rejection seems to disappear the only important argument that has been advanced for the corollary.

If this first step has started us in the right direction, the question arises whether obligation is an emotion distinct from approbation, as anger is from fear, or whether the former is a modification of the latter. I shall contend for the second alternative.

In the first place, approbation is an emotion called out by all manifestations of a good character, those of others as well as of self, my own past as well as my future, whereas the feeling of obligation rises only in connection

with future acts of my own. Obedience to the law of parsimony should therefore lead us to consider with great care whether the more limited phenomenon is not a special case of the broader one.

A far more decisive consideration, however, is derivable from an analysis of the state itself. The feeling of obligation, properly so called, seems never to appear except where we are set face to face with the disagreeable or unwelcome in some of its forms, and are at the same time constrained into accepting it. I think this is virtually admitted by all parties to the controversy, whatever significance they may attach to the fact. Certainly its truth is attested by common usage. We do not ordinarily say that we are under obligation to eat, though the thoughtful man is well aware that eating has an important place in the programme of the moral life. But when the convalescent is brought the food essential to the return of health, then if the sight or odor be distasteful, the feeling of an obligation to eat will at once arise. The use of the word duty, which points to this same factor in the moral consciousness, suggests the same conclusion. "The conference had the privilege, sometimes the duty, of listening to various projects of reform," is a statement I once read in a newspaper. Similarly every one distinguishes between his "duty calls" and the rest of his social engagements. To be sure, duty and obligation are often used as synonymous with right; but this evidently has the same ground as the children's notion that all good things to eat are unhealthful. That is to say, we are apt to think of the rightness of an action only when we should be glad to get out of doing it; in other words, when it is a duty. In view of these facts we seem justified in asserting that the feeling of coercion or constraint is an essential factor in the emotion of obligation.

A second factor seems equally undeniable; namely, acceptance by the will of the unwelcome demand. It is this desire that after all the deed be not left undone which often makes the strong soul go forth to meet the obligation with a kind of joy, that gives it its authority, that leads us to recognize it as at bottom self-imposed. For if the burden were forced upon us by some power utterly alien to the will, we should bear it in the spirit in which the natural man bears sickness or failure, as something to be annihilated without mercy at the first opportunity and to be endured in the interval with such patience as we possess. But acceptance by the will, what is that but approbation? Since everything of sufficient importance to arouse resistance must be approved if it is not to be reckoned simply as an enemy *à outrance*.

If the preceding description can be trusted, obligation may be defined as the feeling of approbation qualified by the feeling of shrinking from the disagreeable. Where the actions necessary to the realization of an ideal come into contact with strong passions, or deep-seated habits, or involve suffering, loss, or effort, there is inevitably a certain shrinking. And yet at the same time we feel ourselves none the less attracted forward by our ideal. Alike, then, whether we play the coward or press onward, the complex emotion I have been describing must necessarily make its appearance. The correctness of our identification of this emotion with the feeling of obligation seems demonstrated by the impossibility of discovering by its side, in the act of moral judgment, a second feeling distinguishable from it and yet possessing any of the qualities attributable to the feeling of obligation.

Thus our analysis seems to warrant the conclusion that obligation is not something outside of and independent of approbation. And since the consciousness of obligation,

together with the objectivity of moral distinctions, are the fields which have supplied the most important arguments against the view that all the facts of the moral life are ultimately expressible in terms of approbation, our analysis of these phenomena, if correct, has contributed something towards the justification of the assumption upon which this study has, throughout its course, been based.

V

THE PROBLEM OF CONSCIOUSNESS

Frederick J. E. Woodbridge

The remarkable philosophical development which began with Descartes and Locke and culminated in Hegel, and which has had various revivals and restatements since, appears to have been controlled by a few basal conceptions. One might even claim that a single conception, namely, the conception of the mind with its related conception of consciousness, has given to the whole movement its significant character and its typical problems. That mind or consciousness should have been made the central fact for the philosophical interpretation of the world stands out as one of the striking achievements of modern thinking. Around this central fact have grown up systems of idealism possessing remarkable ingenuity and thoroughness. Yet there are many indications to-day that these systems, once so generally fascinating, are losing their interest. Among the most striking illustrations of this is the remarkable diminution in the influence of the Kantian philosophy during the past decade. To the average university student to-day, that philosophy appears not simply unconvincing, but decidedly on the wrong track. It represents to him the philosophical expression of the eighteenth-century glorification of reason rather than a serious inquiry conformable in principle to the present status of our general knowledge. The great German systems are not now read with the eagerness with which many of us were once familiar. There are

also indications of radical opposition which has put idealism on the defensive. Pragmatism and radical empiricism, although owning a certain kinship with the great modern systems, are disturbing factors which put many traditional convictions in peril. Natural science, increasing the scope and depth of its interests, and the theory of evolution, in its attempt at recovering a genuinely cosmic point of view, have tended to displace the mind from its central position in the interpretation of the world. There are, thus, not only clear evidences of a transition in philosophy, — our age has long been characterized as one of transition, — but the motives and the direction of the transition are gaining clearness.

The situation has its distinct logical interest, for transitions naturally indicate a change in controlling ideas. Thinking is guided by convictions instinctively or traditionally acquired which seldom come to the surface for critical scrutiny until the systems they carry have attained a high degree of logical perfection. When, however, the system has passed beyond the period of enthusiastic construction and become familiar, its hidden assumptions tend to appear as problems. Astronomy and geometry present classic illustrations of this movement of thought in science. The progress of philosophy follows the same principle and appears to be giving present illustration of it. I propose in this paper to examine certain features of this illustration and to indicate, if possible, some of the directions which this transition is taking. I desire to do this, however, under the restrictions imposed by a consideration of the problem of consciousness.

This restriction has, as I have already suggested, its motive in the central position which the traditional conception of consciousness has had in modern philosophy. It will be my aim, first, to show how this traditional con-

ception has been logically responsible for the characteristic doctrines of modern idealism; secondly, to indicate some of the natural difficulties which these doctrines present; and, thirdly, to suggest a modified conception of consciousness and some of the problems to which it appears to lead.

I

The conception of consciousness which has controlled the major portion of modern philosophy, reaching over even into the thought of such men as Huxley and Spencer, was pretty definitely fixed by Descartes, Locke, and Kant. In Locke, however, it appears to have received its simplest formulation and to have afforded the first clear and definite statement of the fundamental principles which have characterized the idealistic development through Hegel and since. These principles are the following: (1) the only objects of knowledge are ideas; (2) all ideas are acquired; and (3) knowledge is a synthesis of ideas. It is apparent at once that we have here the germs of the idealistic doctrines of phenomenalism, of experience, and of rationally deduced, synthesizing categories. These were the doctrines which the subsequent development was interested in perfecting. The three propositions appear also to have been certain limiting conditions under which the philosophy of individual thinkers took specific directions. They controlled Berkeley, for instance, in his analysis of the meaning of existence when applied to the objects of knowledge, and in his interpretation of the conceptions of the external world, of substance, and of causation. Hume was driven to skepticism because he could interpret only in terms of the customary grouping of ideas that type of knowledge which purported to be valid beyond the senses and memory.

Kant, it would appear, expended his skill in answering the question, How, under the conditions stated, can the understanding be said to have an object at all? and exhibited in the answer what he regarded as the essential synthetic conditions of objects of experience in general. With still deeper logical insight, Hegel saw in the structure of the "idea" itself a fertile and active principle capable of generating a succession of related experiences. But the whole remarkable development moved within the limits determined by the principles of Locke.

While attempts were occasionally made, notably by Kant, to furnish evidence for the validity of Locke's principles, they have usually been presented as self-evident truths, apparent to trained philosophical reflection at least. Yet it is clear that they rest, and did rest with Locke, on an initial conception of the mind and consciousness without which their validity is far from apparent. The mind, that is, was conceived as an original capacity or receptacle, endowed with certain constitutional powers and needing the operation of some alien or resident factor to arouse it to activity. It was the end-term of a relation, the other term of which might be the external world, another mind, the divine being, or some unknown source of excitation. The important end-term was the mind. The other end-term tended constantly to sink into unimportance and mystery, dwindling on the way into the Kantian *Ding an sich*, until, indeed, as in the post-Kantian philosophy, the source of excitation was brought within the mind itself and assigned to the mind's essential instability. This basal conception of the mind as an original end-term was expressed in various forms and different words, but in them all are discoverable the essential originality, isolation, independence, and exclusiveness of that plastic and impressionable thing which through experience of some

sort comes to possess consciousness and knowledge, or to be itself the consciousness of a world.

One sees now very clearly what history has so abundantly illustrated; namely, that the outcome of such an original and controlling conception of the mind and consciousness is pretty definitely determined in its general outlines by the logic of the situation. Strip the mind so conceived of every determinate character, and the concept of it yields, as Hume showed, absolutely nothing. It is then a wholly useless conception. Its value can be preserved only by assigning to it in increasing measure the character which may ultimately give to the whole of experience and the world their essential features. Of this latter method, Kant and his successors are the beautiful illustrations.

The logical influence of the end-term conception of the mind on modern philosophy becomes more evident as one examines with greater minuteness some of its major doctrines. The doctrine of ideas, or states of consciousness, is a natural deduction from it. Locke's statement of the situation is typical: "It is evident that the mind knows not things immediately, but only by the intervention of the ideas it has of them." This statement is clearly evident if the mind is a plastic capacity modified by some sort of operation. States of consciousness naturally appear as distinctly mental facts constituting some sort of an intervening group of existences. Sensations and ideas find their place in the mind alone. They cannot be in the physical world nor have physical characteristics. Being made up wholly of the mind or consciousness, they must obey exclusively mental laws. Their enumeration, classification, and combinations afford psychology characteristic problems. As ideas are the only objects of knowledge, knowledge itself must be explained through either the

association or the synthesis of ideas. This doctrine of ideas or mental states or states of consciousness has been worked out with characteristic skill and zeal in much of modern epistemology and psychology. Every student of these subjects has become familiar with the details and problems of the movement. Note, for instance, the multiplication of ideas and the distinction between substantive and transitive states involving the recognition of such feelings as of "and" and "if," the controversy over the question whether states of consciousness are spaceless and timeless, the association controversy, the puzzling question how one state can know another state, and the doctrine of successive representation. I do not ask what real progress has been made or what satisfactory solutions reached. I wish here solely to connect the whole movement with the end-term conception of the mind as the logical outgrowth of that conception. While this connection gives the movement motive and definition, it cannot, of course, give it truth or validity, for these desired merits depend on the truth and validity of the specific notion of the mind which controls the details, the problems, and the solutions.

The doctrine that knowledge is a synthesis of ideas is a natural derivative from the same conception. The general conditions of the synthesis were conceived by Locke in a very simple way. Ideas, he thought, were originally produced in the mind in an isolated and disconnected manner because of the isolation and disconnection of the avenues of sense. The mind was consequently passive in the first reception of ideas, but as soon as it had received them, it became active, and combined and related its ideas in various ways. Here we find the important beginnings of the doctrine of synthesis, involving its two significant features, namely, an original confusion and a subsequent order, and its essential problem, namely, How is the

passage from confusion to order effected? The history of the doctrine is a familiar story. But it is important to note how some of its most revolutionary features have been motived with a kind of logical necessity. Take, for example, the Kantian doctrine of space and time. This might readily be deduced from Locke's position. Since our only objects are ideas and these appear first in confusion, their subsequent spatial and temporal order must be an arrangement in a space and a time which are first in the mind. And in general, if there are any universal and necessary types of arrangement or order arising out of the original confusion, these types must indicate the fixed mental conditions under which the progress from confusion to order is effected. Their deduction becomes then a pretty problem for the ingenious. Again, thus, there is forced upon one who would analytically examine the progress of modern idealism with the view of discovering its logical motive, the realization that this motive lies originally in the end-term conception of the mind, in the notion of consciousness as a receptivity.

This conception appears not only to have motived the major doctrines of modern idealism, it appears also to have controlled in large measure the various problems which arise when the attempt is made to put the deliverances of the idealistic philosophy and psychology into some intelligible relation with the deliverances of physical science. This is notably the case in the problems of the relation of mind to body and of the efficiency of consciousness. For the thorough and absolute idealist these problems may not exist in any vital or disturbing manner. But for the less thorough, for those who have not yet quite succeeded in attaining a satisfactory deduction of the course and laws of nature from the cognitive syntheses of experience, these problems have been serious. Others

have made them the points of departure for a subsequent idealistic philosophy. But why should such problems exist at all? Natural science may indeed afford some occasion for their existence, and certainly has done so in its emphasis on the principle of the conservation of energy. But it seems to me that science, unaided by the dominant notions of the philosophical movement under consideration, could not have raised these problems in the form with which we are familiar. So long as the mind is conceived as an end-term we may speculate concerning its relation to the other end-term; and so long as consciousness is the mind's possession we may inquire about its relation to the body and its physical efficiency. On this basis automatism, interaction, and parallelism are formally statable problems. Without any appeal to physical science, the logical preference for parallelism is apparent. For if consciousness constitutes an intervening group or order of existences, if ideas or states of mind, with their exclusively mental relations and laws, comprise its whole content, then anything, such as the body, beyond consciousness is forever beyond. No relation, least of all that of efficiency, can be constituted between such disparate existences. If we hold to these existences, the most we can claim is that they are concomitant or parallel.

The foregoing considerations have warranted, I think, the thesis of the first part of this paper: namely, that the conception of the mind as an end-term of a relation, the notion of consciousness as a receptivity modified somehow into a synthesis of its own states, has motived and controlled the development of modern idealism and the characteristic philosophical problems related to that development. I have cited, to be sure, a limited number of instances and treated these briefly. Both the number of instances and the treatment could be extended, but I

have not been able to discover that such extension would do anything else than add to the claims of the thesis. It appears to me, therefore, that the attempt to assault the logical structure of idealism is futile. Such a procedure begets not understanding and appreciation, but only fruitless controversy. If philosophy is to advance in any other direction than a still greater logical perfection — if that indeed is possible — of the structure, the basal conception of consciousness must first be altered.

II

Theories are, however, to be estimated, not only by their logical perfection, but by their believability. The latter excellence is indeed the more to be desired, for a believable theory may patiently wait for its successful logical systematization, while one not believable is always at a discount no matter how perfect its structure. The existence of positivism, to say nothing of the excessively controversial atmosphere of modern philosophy, is proof enough that the completest philosophical product of modern times is not generally credible. The taunt that Hume threw at Berkeley — that the latter's philosophy admitted of no refutation and produced no conviction — has been frequently repeated with wider application. Its significance is typical, and warrants the inquiry why the whole philosophy of ideas, in spite of its logical beauty, has so often produced no conviction. A ready answer might be found in the suggestion that its controlling conception has been repeatedly subject to suspicion. Until quite recently, however, this suspicion has received little really positive formulation. It is worth while, therefore, to examine some of the general causes of doubt.

First among these might be noted the fact that modern idealism, when clearly envisaged in its completest forms,

appears to be markedly artificial, to have what we might call a too predominantly literary character. It is like a work of art, affecting the beholder æsthetically, enthralling his contemplation, rather than like a work of science, convincing on account of the familiarity and homeliness of its terms and its procedure. Besides this it forces upon one a view of things which is not an extension and refinement of his natural, instinctive view, but a radical transformation of it. It begets the sense of illusion, a kind of Platonic wonder. Then, too, it requires a resoluteness of will and a vigorous control of the emotions to hold one up to it with an orderly, every-day acceptance. In eating and drinking, in marrying and giving in marriage, in being born and in dying, in begetting offspring and rearing them, in loving and hating, in wars and tumults, in plague, pestilence, and famine, humanity is very prone to lapse into the crudest forms of realism. There is, undoubtedly, something preposterous in the notion that one can attain to anything like a complete insight into the nature of reality by a scrutiny of the processes of knowledge, while actual living is such a totally different affair.

The artificiality with which idealism is chargeable appears on examination to lie in the logical constraint which its controlling conception exercises. What ideas are and what the mind essentially is are questions to be answered by it *a priori* and transcendentally. Huxley tells us, for instance, that sensations "have no attributes in common with those we ascribe to matter; they are, in the strictest sense of the words, immaterial entities." And what Huxley says of sensations has been repeatedly said of ideas and states of consciousness in general. They are spaceless and timeless, obeying only immaterial or mental laws. To think in this way concerning the objects we directly perceive, is clearly to think under the constraint of as-

sumptions, but not under the constraint of the objects we examine. Ideas *ought* to be immaterial on the idealistic basis. But is this anything more than a statement of what logical consistency demands on this particular basis? Psychology after psychology has told us that we know what mental states are much better than we can define them, and then proceeded to enumerate a lot of things we can put into our pockets or throw out of the window, or take into our stomachs, or shut our eyes and ears to. No wonder that honesty has at last compelled the admission that such things are in space and in time, are weighed and measured, obey the laws of gravitation and motion, so that they begin to look perilously like physical and material things after all. Even Berkeley would admit as much, and yet he could claim that he had dealt materialism its finishing stroke! And Kant, to preserve the doctrine of ideas, *must* make space and time and the laws of nature synthetic principles of the mind! Surely here is the refinement of artificiality. The characteristics of the things we perceive suffer no change by being alternately called material and immaterial. They do not alter their weight or their color or their distances from each other. In themselves they exhibit no striking preference for metaphysical terminology. A preference is imported from an assumption, and that assumption does not throw any light whatever on the character or history of the things we perceive. The statement, therefore, that we perceive states of consciousness rather than physical objects appears to be pretty much of a merely verbal affair.

If we can have no genuine and ultimate contrast between states of consciousness and things which are not states of consciousness, if our only contrasts can be between completeness and incompleteness, or between internal and external meanings of ideas, wherein lies the propriety of

the philosophy of ideas? What gives it distinctive features to set it off by contrast from other philosophies? These are current questions and await an answer. By asking them with perfect clearness and insistence, pragmatism has put idealism entirely on the defensive. The historical answer would appear to be that the distinctive feature of idealism lies in its initial assumption. But if it is only assumptions that make differences in philosophical systems, the dispute about the relative merits of rival assumptions must seem, even to the combatants in their calm and reflective moments, very strained and artificial.

Locke, we know, facilitated his own thinking by his doctrine that all ideas are acquired, and thus furnished the motive for the subsequent idealistic doctrines of experience. Since all ideas are acquired by the mind, we may, says Locke, conceive the mind to be originally empty, devoid of ideas. Let the mind now be capable of receiving impressions, and let some impressing agency affect it, then immediately the mind will have ideas after the old analogy of the wax impressed by the seal. Much of modern psychology has traveled the same road. But what warrant is there for conceiving the mind to be such a receptive plasticity? An empty mind, a consciousness-producing receptacle, turns out to be anything we arbitrarily and artificially choose to make it. We can give it any powers or potencies we desire, and no one can reasonably say us nay. Yet it may be claimed that while the mind may be an assumption, we may not be arbitrary in determining its character, for that, like the character of any hypothesis, must be determined in accordance with the facts of experience. The mind, consequently, can have only that character which the constitution of experience makes necessary. But even so, nothing can prevent our supposing as the correlative of mind the physical

world of Newton, as Locke did, or other minds, as the panpsychist does, or conceiving the mind as an absolute self-representative system, as other idealists do. And so far it would appear that all the facts of experience are accounted for to the satisfaction of him who entertains any one of these suppositions. Yet we can hardly claim that these three suppositions are simultaneously true. Suppose that there is a mind, and its nature may be such as experience leads us to conclude, but that does not warrant us in supposing that there is a mind in order to account for the facts of experience. Fruitful hypotheses from experience are not made after that fashion.

Undoubtedly, if the term "mind" has any meaning, that meaning must be determined by a study of ascertainable facts. But just as undoubtedly that study must begin with the facts as they are given, untransformed by any assumption. And what I desire to maintain is that these facts, in their ascertainable character, cannot be essentially and metaphysically characterized as "ideas" without appeal to assumptions which deliberately attempt to carry us back of the facts to which appeal is made. When this is done, all progress is blocked. Thought then wanders aimlessly in a circle. One cannot reach the mind by claiming that all objects are ideas and then trying to establish this claim by insisting that from the nature of mind ideas can be its only objects. It is precisely the suspicion that this is just what idealism does, that tends again to make it appear artificial and incredible.

A critical examination of the attempted definitions of the physical and the psychical, of the body-mind problem, and of the problem of the efficiency of consciousness, as these problems have been stated and discussed from the idealistic point of view, would only multiply the instances where the philosophy of ideas begets the sense

of artificiality and incredibility. These instances and those already discussed arise within idealism itself. There are exterior sources of doubt which also should be noted.

Among these the contrast which the content of natural science presents to idealistic philosophy has been repeatedly pointed out. No doubt idealistic philosophers may feel little difficulty in harmonizing natural science with their systems. Their claims are not the point at issue. The fact is that natural science has steadily tended to decrease the importance of man and his philosophizing about the world. I do not speak of natural science turned dogmatic and become as final a metaphysics as any idealism ever claimed to be. Such a metaphysics could be, at best, only a rival, and a rival carrying his own big burden of doubt. I speak rather of that sense of a vast and enfolding nature which science in its steady, progressive achievements constantly deepens within us, begetting, in spite of most signal successes, a feeling of intellectual impotence and humility. Under its spell we seem to be of the earth, anchored to it, with our metaphysical excursions only imaginary voyages. If we embark for conquests, our spoils of victory are not of the metaphysical kind. The mind and heart may cry out for philosophies, but nature replies only with what we call scientific knowledge. This contrast between the desired and the attained puts the desired ever within the sphere of hope, never within that of achievement. Thus we are warned that all philosophies must be aspiring and tentative only. No one at all attentive to the spirit of our age can fail to appreciate how deeply rooted this feeling has become. Long ago there arose protestantism in religion, and now there arises protestantism in thought. All this may, however, indicate a return of philosophy to sanity, but it indicates assuredly a source of suspicion of those philoso-

phies which seek to explain the world primarily from the initial fact that man happens to be conscious of a small part of it.

Not only does natural science thus raise doubts of idealism, but also, and more significantly perhaps, does the fact that evolution has been slowly and steadily altering our fundamental ways of looking at the world. It has made it less natural for us to think of the mind and consciousness after the manner of Locke and Kant. We have been led rather to think of it as a thing with a history, an event the causes of which we might some day discover. In evolution there is no mind as an end-term whose relations eventuate in consciousness. There are rather processes of various sorts undergoing continual reorganization until, at last, they become conscious and understand the conditions out of which they grew, learn their own history and genesis, and thus awake to the conviction that consciousness is not something original, but derived. This conception of a natural evolution of the mind and consciousness has not been worked out as thoroughly as the idealistic conception, but, grasped even in dim outlines, it must render the older conception suspicious. What becomes of the vast synthetic machinery of the mind, if the mind itself has been dethroned? Can the question, "How does the mind know the world?" have significance when you are asking the question, "How does the world evolve to consciousness of itself?" To answer, "The world grows to consciousness of itself because fundamentally a mind is, or minds are, evolving a world to know," can carry little conviction to the attentive reader of Darwin and Spencer. The more clearly the concepts of evolution are understood, the more impossible the traditional idealistic approach to philosopy appears to be.

Observe, too, in what a different position evolution

places the body. It makes it no longer some strange phenomenon of mind, a kind of garment with which the soul covers the nakedness of its immateriality. It makes it rather the mind's essential basis and support, a thing wherein the mind can appear. More correctly stated, the mind is the body's perfected operation and achievement, as Aristotle taught us long ago. The question, therefore, whether mind is efficient would appear meaningless to the evolutionist. He would find it difficult to take the problem of interaction seriously. For to him it is quite evident that conscious bodies are more efficient than those that are not. His evidence rests on no speculation as to the relation of mind to body, but on the fact that greater organization means both greater efficiency and a new type of existence. Here he keeps close company with our ordinary kinds of knowledge. No one doubts that beings become more efficient by becoming conscious, any more than one doubts that a live man is more efficient than a dead one. No one doubts it, not because he merely wants to believe it, or because he cannot doubt it, but because the greater efficiency of conscious beings is matter of common knowledge and ordinary proof. How artificial and strained the evolutionary line of thought thus makes a much debated problem appear!

I do not mean to imply that consciousness and its relation to the body present no problems for the evolutionist. He must admit that the peculiarities of conscious activity give to the study of its conditions peculiar interest. That a being when he becomes conscious can think of things very remote, both in time and space, from his organism is a very unique and baffling kind of fact. But I would imply that, in dealing with it, the evolutionist will not be likely to find himself on the road which leads to the philosophy of ideas. When he does that, he has already

despaired of his problem. Huxley, we may remember, reluctantly admitted that if he had to, he could embrace idealism, but also insisted that he would not be compelled to that embrace.

Evolution is modifying also our conception of what "ideas" themselves are, and this modification is distinctly in the direction of setting aside the notion that they constitute an order of existence in a region distinct and isolated from the rest of the world. For if consciousness is the outgrowth of reorganization, what one is immediately conscious of would appear to be only the results of this reorganization. Still further, if we suppose that the history of this process can be continuously traced, there remains no motive for supposing that somewhere an entirely and essentially new order of existences has intervened. Evolution may not be true and its assumptions may be unwarranted, but they exist none the less, and point distinctly to a new order of philosophical problems. Their existence is a natural menace to the claims of idealism.

There are, thus, within idealism and without, reasons which tend to make that philosophy appear artificial and unbelievable, and these reasons have to-day assumed such great proportions that they can no longer be dismissed by the idealist in the easy fashion which too often is his wont. He can no longer simply bid the doubter study Kant and Hegel once again. He can no longer discharge with telling effect the reproaches of materialism and naturalism. For we have attained a new respect for matter and a new affection for nature. We seem to have entered into a new world, where, indeed, we may not see very clearly, but where there is light enough at least to show that no extraordinary wild beasts are waiting to devour us. We may have lost much, but surely there must be a fair prospect from the hills we see.

III

The need of reconstruction in philosophy has thus been felt in many quarters. However varied the attempts to meet the need may appear, they have in general regarded the problem of consciousness as fundamental and initial to any satisfactory reconstruction. The necessity of such a point of view may be seriously questioned. An enlightened naturalism might see in the fact of consciousness no problem of a peculiar or fundamental kind. It might be claimed that when we become conscious we become able measurably to understand the world in which we live and to discover the natural conditions on which our becoming conscious depends, but that the discovery of these conditions presents the same sort of problem which the discovery of the conditions of any other event presents. If it should be objected that this procedure involves the assumption of the reality and validity of knowledge, and thus an epistemology, the naturalist might readily assent. He would probably claim, however, that the attempt to discover anything whatsoever, even the validity of knowledge, for instance, makes the same assumption. He would doubtless point to all existing epistemologies in confirmation of his contention. Yet even so, there is at least an opportunistic reason why the philosopher should assign special importance to the problem of consciousness. That problem has been the central and controlling problem of modern idealism. Our philosophy has become so disturbed and disorganized by it, that we cannot hope to find our way about with confidence and freedom until the problem has been reckoned with. We can hardly dismiss idealism cavalierly as a great mistake. The field of consciousness, however small it may be, remains the point of departure for every inquiry and the point of arrival for every solu-

tion. This fact, which idealism has put beyond all haughty disregard of it, furnishes a reason much more than opportunistic for a special interest in the problem of consciousness. There would seem, therefore, to be both propriety and justification for the continued importance of that problem.

The recent attempts at reconstruction to which I have referred show a general agreement in their conception of consciousness. Instead of conceiving it as an end-term of a relation, they have conceived it as a relation itself. If this change is to mean anything more than a merely logical contrast with the starting-point of idealism, or a new assumption the conclusions from which are to be deduced, it is important that the sense in which consciousness is conceived as a relation should be made clear. To this end we may make an examination of the conscious situation itself from such points of view as may prove suggestive. It is perhaps the difference in points of view rather than in the real nature of the results reached that accounts for much of current misunderstanding. I desire, therefore, to lay special emphasis on the point of view adopted in this paper, namely, the point of view of our reflective conscious inquiry. No situation can be more familiar to us or less equivocal than that in which we deliberately engage in some sort of inquiry, seek to solve some problem, or put questions to the objects and events of life in the hope of getting the answers we call knowledge. The situation is, in short, that of our conscious inquiry into whatever we may be conscious of.

It has been claimed that it is impossible to examine such a situation. While such a claim appears to me to be not only incapable of justification but also absurd, a brief consideration of it may aid the purposes of definition. The claim in question asserts that from the temporal or

flowing character of consciousness we can never be conscious of a situation at the same time in which the situation exists, but are conscious of it only in representation. Stated in terms of introspection, we introspect only situations that have passed; in terms of states of consciousness, one state can never be its own object, but the object only of a succeeding state. I was about to say with reference to this claim what has been often said: namely, that if it were true we then could never introspect anything or be conscious of anything. It is more important, however, to note that the truth of the claim is a matter about which it may not be profitable to dispute, for we want to know whether consciousness has just that flowing, successive character which gives to the claim all the force it has. Surely, if that question cannot be settled, the claim is at best only gratuitous or presumptive. If the question can be settled, however, I am perplexed in trying to understand what an affirmative answer really means: for so far as I am aware, every affirmative answer has really presupposed the successive character of consciousness. The presupposition may have some doctrine of time back of it. If so, the question is pertinent, Have we consciousness of time? Again, the alternative answers appear either to throw no light upon the question at issue, or simply to continue controversy. I would emphasize also the fact that the doctrine of successive consciousness is bound up with the end-term conception of the mind and the doctrine of mental states.

The dispute, however, may, as I have suggested, aid the purposes of definition. Whatever we may conclude the nature of consciousness to be, we start our investigations from a point that can be commanded. Our conclusions are derived from that commanding point; they are explications and elucidations of it. We may admit that

it is possible that our conclusions may completely revolutionize our point of departure, but it is important that we should always see just how that revolution is effected. So long as we cannot do that, we are still in the realm of tentative guesses. I feel constrained, therefore, to abide by the limitation I have imposed. Problems appear only in situations immediately within our grasp. No matter what causes may have generated them, they must first be problems for inquiry before their causes can be discovered.

The same considerations warrant, I think, the rejection of the genetic point of view for the primary consideration of consciousness. Consciousness may, no doubt, have had an evolution, it may begin to be, and the conditions of its genesis may be discoverable. But clearly that discovery will be made by starting from some present situation which must first be defined if the discovery is to be estimated properly. Again, there may well be lower grades of consciousness which are prior to the grade where problems exist, and out of which problems emerge; but such grades are inferred in order to answer existing problems which must first have been stated. In short, a metaphysics of consciousness, an inquiry into its nature as an existing concrete situation, appears to be fundamental to any fertile theory.

Theories of perception are not directly a help in such an inquiry. They have, indeed, been more productive of confusion than of enlightenment, on account of their connection with the doctrines discussed in the second part of this paper. Yet the present status of the theory of perception has an indirect bearing which should be noted. The theory appears to have attained the character of a natural science, and as such has the same general philosophical bearings as any other natural science. This means, of course, that the theory does not exist to its

own prejudice. It exists rather in its own right. By that I mean that the facts in terms of which the theory is formulated do not undergo any transformation in their nature on account of the theory, although they may undergo refinement and extension. The psychologist discovers what the conditions of seeing or hearing are, precisely after the manner in which the chemist discovers the conditions under which certain combinations occur. In each case we start with definite, relatable facts which remain just those facts and no others throughout the inquiry. No other presuppositions are made besides the existence of the facts in the manner in which they are found to exist before the theory is framed. The theory of perception as a theory of natural science does not interpose a percept between a mind and a stimulus. It simply takes the stimulus and asks what machinery is involved in perceiving it. There is no mystery about the stimulus. It is always something that can be produced in definite, concrete form. The act of perception is equally definite and concrete. Given the definite stimulus and the definite act, the theory simply asks for the machinery which connects them. When thus conceived the theory of perception can throw no direct light on the nature of consciousness. It may illumine the question indirectly by showing that in order to exist, the theory of perception does not need to distinguish between what we are conscious of and what not. It takes its departure, therefore, from just the sort of initial situation which a theory of consciousness should attempt to define. To that situation we should now turn.

In general, the situation of conscious inquiry exhibits a great variety of things, grouped in various ways and having manifold relations to one another. A book may be on a table, a bunch of flowers may be in a vase, a

stroke of a bell may follow a previous stroke, a pain may be in the head. The whole situation seems resolvable into things related somehow to one another. Some general types of relation stand out more prominently than others. Conspicuous among these are the spatial and temporal relations. On account of their character it is impossible for one to be on a distant elevation without going there. These relations hold the things together, constitute such bonds between them, that any alteration which space and time permit must involve a certain amount of change both in space and time. Thus we may bring materials together from far and near and in the course of time erect them into a building. But even before the materials are collected and reared they may suggest the future building or many incidents of their own history. This fact reveals another conspicuous relation which holds the things together in quite a different manner from the spatial and temporal. One thing may be a certain measurable distance from another thing, but it may *mean* that other thing without encompassing the distance. And I wish to emphasize the fact that this relation of meaning which is so prominent among the things is just as much *a relation between them* as is space or time. It is the ice which means that it will cool the water, just as much as it is the ice which does cool the water when put into it. The water which means that it will quench thirst is the water which does quench thirst when swallowed. I take a powder to dispel the pain in the head, not only because pain and powder are incompatible in juxtaposition, but incompatible also in their meanings.

We should note, moreover, that the relations of meaning are capable of remarkable systematization, synthesis, condensation, and unification, and that this takes place apparently without any corresponding change in the other

relations which subsist. The meanings of the solar system may be condensed in a book, but not the solar system as a thing in space. Here, I suppose, we find the motive, so prominent in philosophy, for making meanings immaterial. For the syntheses in the meaning relation are as different from those in the spatial and temporal relations as the immaterial and the material could well be conceived to be. In spite of the burden of perplexity which these terms have had to carry, they have done too good service to be wholly discarded. So I venture to formulate the facts I have noted as follows: The situation under examination exhibits a variety of things in a variety of relations, but some of the relations make possible a material synthesis of the things, while one of the relations makes possible an immaterial synthesis.

The situation has been described as conscious. Without now departing from the situation itself, or seeking a position prior to it or beyond it, I should like to suggest that it is by virtue of the possibility of the immaterial synthesis alone that the situation is so described. The distinction between consciousness and not-consciousness would thus be brought within the situation itself, and be capable of verification and examination by any one interested. Such a view is at least largely consonant with common sense and science. For under their guidance we are wont to think of a world without consciousness in it as a world devoid of meaning. Add consciousness to that world and then meaning is added, but nothing else. But it is often claimed that in adding consciousness, we also add at least the so-called secondary qualities and pains and pleasures. I cannot examine this contention here with the thoroughness it merits, but I may observe that it is still in the realm of doubt and difficulty. In addition it is to be noted that the secondary qualities, and pains

and pleasures also, are capable of the contrasted syntheses I have emphasized. Still further, when we ask for the proof that secondary qualities and the like are due to consciousness, the proof is always stated, not in terms of consciousness, but in terms of a physiological organism which is one of the things in the conscious situation. These facts make it extremely difficult for me to assent to the statement that consciousness is in any way responsible for the specific characters of the things in the conscious situation. In the absence of logically coherent proof that it is, I incline to the more natural view.

Such phrases as "conscious of" and "conscious that" have often been taken to indicate that consciousness is not simply the kind of relation I have indicated, but that it has in addition the property of "awareness," which gives to things a peculiar and immediate kind of presence. I am not sure but that we find ourselves here in a verbal difficulty, for what is it "to be aware" of anything? If we cannot make the "awareness" responsible for the thing's qualities or for its spatial and temporal relations, what is then left to constitute that peculiar presence? Indeed, it seems to me, on analysis of the situation, that just this character of "awareness" turns out to be the manifold and irresistible meaning connections which the things in the conscious situation have. These connections hold the things in such a network of immaterial groupings, that their presence is quite other than merely spatial, temporal, or specifically qualitative. It is to be noted also that the "awareness" diminishes in its evident character just in proportion as the linkage of meanings becomes deranged. I do not find at present, therefore, convincing facts to indicate that "awareness" involves an additional characterization of consciousness.

Such is the initial conception of consciousness which I

wish to suggest. It appears to be a relation between things which makes a synthesis of meanings possible, a relation markedly distinct from other relations between the same things which make possible other sorts of syntheses. That the conception may not be misrepresented, I would call attention again to the distinct limitations under which it has been formulated. No attempt has been made here to discover the conditions under which consciousness exists or to show why it has its specific character. My sole attempt has been to examine the situation where all our problems arise in the hope of discovering in it an initial conception of consciousness the further development of which might be fruitful. I am of the opinion that such an attempt is fundamental to all further inquiry, and affords the point of departure for an investigation of genetic conditions. Naturally, the conception is not itself a solvent for philosophical problems, but is rather a creator of them. I should like, therefore, in conclusion, briefly to indicate some of the problems which it suggests.

The description which I have given of the conscious situation accords, I suppose, with an idealistic description of experience when experience is taken in its immediate and evident character. After Kant, no one can claim any novelty or originality in pointing out a synthesis in space and time or a synthesis in the "understanding." It is important, however, that these syntheses should not be construed after the Kantian fashion or on the basis of idealistic assumptions. They should in no sense be tainted with "subjectivity." They should not be regarded as syntheses of "phenomena." Yet the idealistic attempt to "deduce" them presents, in its essence, a problem to engage attention. In other words, if we may describe the conscious situation as a grouping of things in different

syntheses, the question whether these syntheses are coordinate or subordinate to one another, or involve a general, unifying synthesis, is a natural one to ask. But prior to asking it, the situation presents the general problem of groups, relations, and syntheses, their kinds, their classification, and their most general definition. The science of mathematics has already been so productive in this direction that we may confidently look for still greater aid from it. If all things exist in relations, we may naturally regard the relational formula as expressing the simplest and most general type of existence. It would appear that this formula, if it is to be general, should express a relation of some sort between two variables, and thus be of the general form xRy. This formula applied to any situation would mean that R expresses the way x and y vary in relation to each other, but not the fact of variation in x and y. It is thus apparent that R will always express a law and be a principle of uniformity and necessity, while x and y will express facts which are a source of change and variety. If we are dealing with the causal relation, for instance, R will express the fact of uniformity and necessary connection, while x and y will express the fact of efficiency. The general problem of "deduction" would thus involve the discovery of an R of such a type that, as x and y vary, their variations will result in an order of R's. But it is to be noted that the fact of variation in x and y could not by this means be "deduced." Their original variation is essential to the deduction.

It is at least superficially apparent that these considerations apply to space, time, and consciousness as relations between things. Each of these relations conforms to the general type indicated by the formula. The relation space, when defined, expresses certain laws and necessary

connections which, no matter how the things in space may vary, are always in force; and it is, of course, true that the things vary in many ways in independence of this relation. The same general considerations apply to time. They appear to apply also to consciousness. If consciousness is defined as the relation of meaning, then the fact of meaning gives rise to certain necessary connections which it is the business of logic to formulate; but the things related in consciousness will vary independently of that fact. And this seems true. Call the things in consciousness by whatever names we please, they appear to vary independently of the existence of consciousness. Otherwise, logic should suffice for all the materials of knowledge. Thus it would seem that if consciousness alone ceased to exist, things might still be connected in all their other relations. This would undoubtedly be the case unless the existence of consciousness were so bound up with the existence of all other relations that its disappearance necessarily involved theirs. In this case consciousness would appear to be the type of relation required for a deduction of an order of relations. Yet even so we should still have independent variables as necessary constituents of this basal relation. Consciousness is, however, apparently not of this fundamental type. Its intermittent existence seems to forbid it. Of course its intermittent existence is not a fact in the conscious situation; but of course, also, there are changes in things in other relations, which changes do not take place in the conscious situation itself. We are forced, therefore, to distinguish between permanent, or relatively permanent, and intermittent relations. "Deduction" would naturally proceed from the more permanent relations. The problem thus presented may be impossible to solve, but one is tempted not to dismiss it without serious examination.

Intermittent relations themselves present a variety of problems of peculiar interest. I shall mention only one of them, and this one on account of its intimate connection with the general problem of consciousness. Many intermittent relations — and some of the permanent ones too — are, so to speak, centred. Some group or some one of the things connected in them, is of such a character that its variations determine in some way the scope of the relations. Such centres wherever found, present problems of special difficulty. The body, or a part of it, or a systematization of its parts, is such a centre in the relation of consciousness. I need not detail the problems which arise from this fact. Their solution, however, can be facilitated, I think, in proportion as we devote attention to the study of similar centres in other relations. It is not unlikely that they all have common features. If these were once discovered, the task of ascertaining their specific features could be more readily outlined. The hope also may be entertained that a study of such centres and of the general fact of relations would yield a body of knowledge of wider applicability than the very narrow domain within which philosophers are very prone to allow themselves to be restricted.

I have defined consciousness as the relation of meaning between things and suggested that "awareness" may be but another term for meaning. Yet it is apparent that a specific characterization of the relation consciousness which would helpfully distinguish it from all other relations must be much more than a matter of names. For while the general characterization of consciousness as a relation may be a fruitful means toward philosophical reconstruction, its specific characterization must be thoroughly worked out, if the relational theory of consciousness is to approach completeness. To assign consciousness

to the intermittent and centred types of relation is a step in that direction, but this road, thoroughly traveled, may leave regions of investigation still untouched. The personal and self-reflective character of consciousness, its privacy, its continuity, and other characters which have often been enumerated as its essential features, should be shown to be various aspects of its specific character or deductions from it, or to be connected with other more general features of the type. The specific characterization of space in terms of such axioms as that of free mobility has done much for those departments of knowledge the objects of which involve the space relation. We need corresponding characterizations of time and consciousness for similar successes.

Another group of problems is connected with a study of the types of synthesis which are effected in the conscious relation. Indeed, some of the problems cited in the preceding paragraphs may belong to this group. But I refer here more especially to those syntheses which give us related or contrasted bodies of knowledge. The results of such an examination would appear to involve a developed doctrine of categories, providing us with their enumeration, their relations, and the methods and genesis of their formation. The bearing of such a doctrine on logic and metaphysics would doubtless be far-reaching. Evolution as a category of wide application has familiarized us with the conception of a reality in constant process of transformation and reorganization. The place of consciousness in such a process and the conditions of its genesis there afford inquiries of endless interest and fascination. Indeed, if the world evolves to consciousness, we should have in consciousness itself the most immediate and significant instance of evolution, revealing what that process is in its most intimate and essential features.

VI

THE INTELLECTUAL ELEMENT IN MUSIC

Edwin Lee Norton

I

This paper approaches musical experience from one, and that an often neglected side. It is concerned, not with an account of all the more essential factors in musical appreciation in their due relation to each other, but rather with the function of relations in the appreciative process, with its conceptual or universal aspects. While the nature of music as an art will not be forgotten, it is hoped to elucidate this from a particular point of view. Accordingly our thesis will accent musical thought rather than musical feeling. This may explain the apparent one-sidedness and intellectualism of the view that is to be developed.

It is proposed to take thought in the broad sense of the mind's apprehension of meaning and relations, whether or no this is found in a developed and highly complicated and abstract form. This certainly is the germ of thought. It is presupposed that all cognition involves thinking, and that the cognitive aspect of a concrete process of appreciation is of æsthetic importance; *i. e.* that thought has a function in music. One may distinguish between the logic of philosophic and scientific procedure as formulated in the text-books on deduction and induction, the logic of practical life found in various degrees of perfection from crude purposive thinking up, and the logic of æsthetic experience. At the same time, these have a common

ground, and a part of our aim will be to point out their essential similarity.

The logical function of musical ideas is to control musical experience, to secure appropriate reactions and realizations. The method of the readjustment of the parts within the whole process through the instrumentality of the universal is logical so far as it is adequate; it becomes illogical, but not alogical, through its failure. The logic of the experience is its universality, its adherence to musical law, its adequacy. Thus the rationale of appreciation is the doctrine of its immanent logic. Premising the pragmatic view of the function of knowledge, one may rightly speak thus of the logic of music, as of that of any concrete process of experience.[1]

Musical thought exhibits different stages of development ranging from sensuous feeling to inference. The affectively toned related sensation may function as a sign of meanings determined in previous experience. In listening, the perceptual phase of thought is always present. Concrete imagination in terms of auditory and other imagery often plays a part, but thought may take a more abstract form. The inner connections of the music may be attentively observed, or the process may be one of systematic association based on previous thought, — a process still purposive even if lacking conscious control. But whatever the structural form, the universal aspect of the process is of prime functional importance. As every relationship within or between melody, rhythm, and harmony has such a universal character, then attention to these relations, whatever they be, is thought activity, and it is judgmental in function.

[1] Cf. Dewey, *Studies in Logical Theory*, p. 19. I am glad to acknowledge also my general indebtedness to Professor Dewey's method and point of view.

A preliminary word is in order regarding the relation between musical appreciation and thinking. Just as logical thought cannot ultimately be divorced from sensation, feeling, and action, so can the converse be maintained: that musical feeling is not divorced from thought. These are terms in a continuity, phases of an organic process. No rigid line can be drawn between philosophic, religious, and æsthetic contemplation, as is evidenced by the imaginative views of Plato and many another poet-metaphysician. Contemplation may be discursive as well as intuitive. If the function of thought is confined to the determination of the relations within the ideal musical world, such disinterested practical play of the mind is certainly æsthetic; it is an attempt more explicitly to realize the ideal completeness of the art object.

Musical value is found neither in mere affective quality nor in mere sensation, nor in mere emotion; these are signs, materials, or summaries of a value greater than they. Musical value is not merely immediate, nor is it constituted and finished once for all. It is rather a process as continual and unceasing as the music; it is progressively determined and in part constituted by intellectual mediation.

Before entering upon our main theme we should notice the contrast between the implied and the explicated aspects of musical thought. Universal relationships and meanings are sometimes assumed or taken for granted as far as their determinate character is concerned; or again they are merely suggested rather than clearly grasped and given explicit statement in the mind. Every one admits the prominence of this suggestive phase of art, especially of music; but its logical import is seldom recognized.

Two chief functions of the implications of musical thought may be distinguished, retrospective and prospec-

tive reference. On the one hand there are assumptions of meanings that were developed and explicitly realized in previous time; on the other there are suggestions of meanings not yet determined by attentive scrutiny. All thought has its familiar and novel aspects, either of which may be in a measure implied, and either such implication may be a means of controlling the development of the other; *i. e.* its enrichment and better accommodation to the total situation.

The last sentence indicates why the implicit element may have logical value. Its ability to control the appreciative process and to realize the meaning of past or future in their connection with the present, is based upon its felt power of substitution. In the emergence of the explicit from the implicit or *vice versa*, the product is significant because it represents portions of the previous process. In thus pointing beyond itself, the implicit has vicarious value and is conceptual in function. So it may serve to develop, define, and refine the æsthetic susceptibility.

The influence of harmony on melody may be cited as an illustration of the logical value of the implicit factor. In many instances, such as the Pilgrims' Chorus from "Tannhäuser" and Schubert's "Am Meer," the thought implications determine for the appreciator the nature of the melody; for this would be very different without his vague feeling of its harmonic setting, whether this accompaniment is a part of the actual presentation or only tends to an imaginative revival. If a melody has been learned first without the accompaniment designed for it, the latter may be found objectionable. One may resent its determinations as making changes that, according to one's previous conception of the melody, ought not to be permitted in its intrinsic relations. Such was the history

of the writer's acquaintance with Jensen's "Lehn' deine Wang'." In such a case the introduction of the harmony causes a psychical disturbance whose logical import is the tendency to remodel either the objective composition as regards its harmony or the subjective appreciation of its melodic meaning.

II

Musical concepts are general ideas or notions that spring from the concrete experience of music, are gradually systematized in musical theory, and thus become a source of further deductions in the intellectual world as well as instruments of practical guidance in musical activity. A variety of examples will now be described and classified, for this seems to be the most illuminating approach to the subject. The examples will be given without observing any special distinction between the more explicit and the less consciously developed concepts. It is not contended that they are all clearly present in the ordinary musical experience. But assuming their compatibility, when thus developed, with musical activity, they deserve notice under the general caption of concepts.

Music has three aspects, three sources of value, known as material, form, and expression, and in different degrees these are conditions of our reacting toward stimulation as musical. The primary logical division is that between the musical and the non-musical world. So tone as opposed to noise; organic combination in accordance with musical law as contrasted with either the isolated element or mere incoherent juxtaposition; vitality, soul, and associative value (whether personal or objective) as opposed to mechanical deadness or emotional indifference, — these three are among the most general musical concepts. The inner constitution of each one involves more than the

mere abstract common element; each involves a tendency to differentiation; the concept of form implies types of form and details of musical law; that of expression implies modes of expression, etc. This remark holds good through the whole list of concepts that are to be noticed, which, by the way, fall mainly under the category of form or structure.

A highly systematic concept is exemplified by the musical scale. In this notion, abstraction is made from rhythm and all other features of concrete music save melody and harmony, so as to effect an arrangement in serial order of all those relative pitches which are available as musical material. The use of this concept according to musical laws reveals its nature, which is further specified in part through the three important notions of distance, direction, and melodic relation or affinity. These are all relational concepts; but in its higher development and taken psychologically, distance is a quantitative determination of relation, while in direction and affinity relation remains a simple quality.

Any tone in a melody, as regards its mere pitch, then, is conceived as part of this complex system and as having a locus determined by it. For first, it has a place in the ascending-descending series, separated by a definite interval from other known tones. And second, it has a recognized and distinct affinity for one or other of these tones. Here its relation to the tonic is the most important conceptual feature of the system. In any phase of musical activity, whether composition, performance, or appreciation, the use of the scale concept consists in its enabling one to pass in an orderly fashion, involving on the whole a minimum of groping and of friction (so far as is consistent with realizing the various particular logical moments involved in musical and æsthetic activity), from

any one point to another in the series. Of course some friction is present in all readaptation, and is at the basis of all æsthetic consciousness and particularly of those logical meanings so essential in musical structure. The nature of the "orderly fashion" of transitions is determined by the subordinate concepts, distance, direction, and relation, under the control of higher æsthetic laws.

While the locus of a tone is definite, this is not conceived as a mathematical point in a line, but as a place of possible variation between limits almost indistinguishable. Within such limits, points are taken as equivalent. The scale in its essential features as just described is indifferent also to absolute pitch; all that the concept requires is a systematic adjustment of part to part within the whole. Therefore we speak of one and the same melody as being sung in different pitches, since the systematic relationships are the same in the two cases. But when such a recurrence of the melody is within one musical whole, the concept of modulation or of a dependent melody must be introduced to signify that we have two equivalent systems of relations focused about different points which are themselves related. This is like a play within a play, or a dream that one is dreaming. The concept of variation within limits is for application systematized in the scale of equal temperament, and this it is that makes possible a recognition of the melody's broader external relationships, and permits us still within an extended composition to admit the two melodies as identical.

Rhythm is a systematic concept in which the principle of equivalence is important. The musical movement is divided into successive parts, measures or fractions thereof, and each part has vicarious value, being capable of substitution for any other part of the same rhythmic grade. Thus measure is equivalent to measure, or eighth

note to its fellow. Even the stressed tones that mark the rhythm are equivalent to the unstressed, for the accent can be shifted to a novel position, as exhibited in syncopation, in which beat and stress are at variance. As the scale is primarily concerned with relative rather than with absolute pitches, so to rhythm the absolute point of stress is of less importance than is the regular recurrence of stress. A melody may or may not begin on the accented beat; and of its various phrases, some may begin one way and some the other. A measure is capable of extended division and subdivision after such manner as to render four eighth notes equivalent to a half note in the rhythmic figure, or *vice versa*. Measure is a proper substitute for measure, whatever its complexity or simplicity, throughout the one melody. Thus the principle of rhythm is the recurrence, according to a regular abstract order, of stimulations or groups of stimulations.

However, rhythm is not identical with tempo, for either may change while the other remains the same; nor does its equivalence amount to mathematical equality, though rhythmic figure has a mathematical as well as a psychological basis. While the numbers indicating rhythmic divisions signify relative durations, the demands of expression interfere with their accurate observance. Every measure or rhythmical unit begins with a beat, a regularly recurrent and significant pulsation, but the bearer of this significance, the mark of the principal rhythmic division, need not always be the same kind of content. Very frequently it is stress on the first tone of the beat, increased intensity of attack. But it may consist in the lengthened relative duration of this first tone at the expense of those directly following it, a just perceptible variation from the equality of the fractional parts of the rhythmic unit. Of course either of these methods occasionally may come into

conflict with expressional devices. The latter one is said to have been used and taught very effectively by the violinist Joachim.

All rhythm both embodies and meets the requisite that the various phases of a process should come at the *right* time. It seems to be the simplest solution of that need become an objective demand. In the broader life of humanity our various modes of measuring time are regulators of activity, important instruments in the process of socializing behavior, which aid (though they do not require) rhythmic and concerted action. In proportion as one's mode of daily life is rhythmic can his habits agree with those of others; he becomes able to eat, work, play, and sleep when others do. So in music, while there is an individual, organic, and æsthetic basis for rhythm, the teleology controlling its early development has been largely social, either because of the connection of song with group work or the dance, or because of the need of a unifying factor in purely musical ensemble performance. Apparently, then, as a quantitative, mathematical concept, its demands would be best satisfied by complete mechanization. As it is indispensable that we live by the clock, should not musical thought and practice be regulated by the metronome?

I believe that life and music are in this respect quite analogous, and that here music may be taken as symbolic of life. An erroneous view of the subject is due wholly to neglect of essential factors, to one-sidedness. The above discussion makes patent the presence in the function of the rhythmic concept of a dialectic between subjective and objective values, between individual and social needs, and between the demands of expression and of form. But the two sets of values or needs must be harmonized, for each value positively involves the other. Music is to a

great extent a social phenomenon, and a performer, in order to make a piece comprehensible to hearers, must not only phrase and accent carefully, but must approach in his rendering the ideal of equality between durations; only thus can the composer and himself express themselves and human life through the music. Regular rates of acceleration or retardation are quite compatible with this, and any other temporal changes that leave one in no doubt as to the relation between stresses; but spasmodic playing is rarely legitimate. The notion of variation within limits applies even more patently here than to pitch. The limits are determined by the relation that must obtain between subjective stresses and objective durations. For these must in all cases correspond. Measured durations are the chief counters by means of which feelings of relative stress can be communicated. Objective stress is another means, but its use is more often interfered with either by the complexity of rhythmic figure or by the demands of expression. The relative durations are then to be regarded as the equivalents of subjective rhythmic feelings, and as the proper substitutes for them. It may be a fact that one with a good time sense often has a poor sense for rhythm, or *vice versa;* but this is not the musical ideal.

The distinction between individual and general concepts should be illustrated. Under the former falls the idea of any particular motive or phrase as this identical self-subsistent whole. Among the constituents of such an idea are certain universal qualities of the object. The functioning of such an idea is seen in memory and recognition, and in a judgment of value about the object. One has a general concept when some aspect of a concrete movement, possibly shared by other movements, is noticed or becomes an important feature in interpretation,

— when, for instance, a melodic or harmonic relation, abstracted from its setting in tone color and rhythm, is taken as a type and identified in various contexts.

Certain concepts are of great importance for guidance, particularly in performance, but also in the other phases of musical activity. Consider how important for interpretation is the constant functioning of the sense for the keynote; the feeling of what the main rhythm is, however disguised (for instance the 2/4 figure), and the relative tempo (*e. g.* an accelerando in allegro); an idea of the style (as cantabile or pizzicato), or of the dynamic continuity or change (*e. g.* constant pianissimo, or crescendo and alternate accents). Notice that among the manifold possible characteristics of musical progression, certain ones are found sometimes together, sometimes separate. This not only makes possible the development of the distinct concepts, but their origin is due to the need that the tendencies and habitual reactions from which they spring should be differentiated and better adapted. Thus the temporal and dynamic changes just mentioned may be quite distinct, and there may be need to resist a tendency to interpret accelerando also as crescendo. The fact that many aspects of musical movement are indicated in the score by words shows their conceptual nature; for pitch and rhythm are not the whole of music. At the same time it is the least complex, intricate, and intellectual aspects of the music for which these directive words stand; and the comparative absence of words, whether on the score or in the auditor's mind, to express the most essentially structural side of music should not blind one to its intellectual nature any more than the use of signs in algebra.

To the hearer such guiding concepts are none the less of value though words may not arise as their symbols,

though one could not give them a technical explication, and though they may never function save in the presence of positive or negative examples. The activity of one of them (*e. g.* the tonic feeling) not only aids in the apperception of this special feature of the music, but within certain limits helps the mind grasp the whole movement. Yet it is true that too keen a sense for one feature, like rhythm, may interfere, not perhaps with an easy reaction, but with a discriminative, objectively valid reaction to the complex object. Some of these concepts aid one in storing in mind subtle and not readily describable characteristics of a piece which become important logical factors in one's assessment of its value, though they are not made abstract objects. One may feel the pizzicato accompaniment by the orchestra as having a peculiar fitness, without contrasting it with the absent legato; or a passage may be noticed as an unaccelerated crescendo in that it is noticed as it is in its wholeness.

The description of guiding concepts has more than once suggested and illustrated the last group to be dealt with, that of abstract musical outlines. A concrete musical progression may be viewed as the vital union of different aspects (this does not refer to stages or brief portions) of the movement, which are in themselves not music, and which may, whether in whole or in part, be embodied in other pieces. There are outlines of the first and of the second degree. (1) Principal outlines are illustrated by abstracting any one of the following aspects completely from a musical whole, be it long or short, — melody, harmonic accompaniment, rhythm, tempo, and dynamic features. Each of these is an abstract though fairly particular form. If it be long, it will be proportionately vague and uncertain and, like a long piece of music, capable of thorough comprehension only by its serial expansion.

Such expansion will either reveal the inadequacies of the outline concept or, in case tendencies to error are readily checked, show its perfection. (2) The subordinate outlines are abstractions from the principal ones, and are instanced by the following discriminations: In melody one can abstract a theme out of the body of its variations, and in general can distinguish the essentially structural portion from the ornamental, though where the line should be drawn is often theoretically uncertain. Trills, turns, grace notes, often accidentals, can sometimes be ranked as ornaments. When dependent melodies are incorporated in the melody of the primary tonic, the different melodies thus interwoven can to some extent be discriminated, certainly in study. In harmony, crucial chords and changes can be detected which give special significance to their context. The distinction of the separate melodies in a piece of polyphony by Bach would yield outlines of this order, or of the first; for each outline here is more individual (at least in its union with rhythm) than most of the subordinate outlines. Finally, the main rhythmic outline may be abstracted from its complications, divisions, and details; also differences of rhythm connected with the component melodies of polyphony, as in syncopation when the absolute accents of the parts do not concur, or in case of duple rhythm in one part and triple in another. Such a distinction of rhythm also makes it easier to distinguish the melodic components in polyphony.

It must be admitted that to insist on the constant presence in the hearer's mind of a great variety of such outlines as structural existents would both do violence to the psychological facts and tend to sacrifice the æsthetic for an intellectual attitude to music. The objector puts two questions: (1) Are musical outlines either a fact or a possibility in the auditor as such? and if so, (2) are they

of any utility to appreciation? A single answer, however, will suffice for both questions; since if such phenomena had no valid function within the art, we can be sure they would have no existence there, generally speaking; their usual presence would be a pretty good indication of their usefulness. Now there is no doubt that when one is not in the æsthetic attitude, all the concepts described and many more are possible constructions. Nor is there any doubt that some of these products of intellectual study serve to enrich the subsequent enjoyment of music. Both their importance and the ease of their formation vary, and not always concomitantly. In the more complex and intellectual forms of music, melody may be a more important feature than rhythm, at least it is not inferior to it. But rhythm is more readily treated as an abstract outline than is melody, and for two reasons: melody is employed only in music, while rhythm is embodied in various other activities; and again, melody naturally seeks a rhythmic embodiment. The latter reason implies that all music is rhythmical, and is therefore weakened by the undoubted fact of a class of arhythmical music, in which either harmony substitutes for rhythm as a unifying factor (as in the chorals of the Middle Ages), or strict musical form is sacrificed to expression (as in the recitative). Dynamic form is an example of a feature somewhat readily abstracted by the hearer. It is true the rhythm is apt to adhere to it, for rhythm tends more than any other feature to interpenetrate the whole movement. Still the dynamic values may be noticeably felt for themselves, since they correspond to typical forms of emotional manifestation and in a sense express spiritual life in the abstract. For the same reason the dynamic outlines as well as the rhythmic are of real æsthetic utility.

When on the one hand a critic denies the value of mu-

sical outlines as well as of the theoretical training that might foster them, and on the other hand insists that musical value is based on structure and therefore that the active attitude, which makes an effort to grasp and master the object, is superior to the passive one, in which the auditor is overwhelmed by the mere stimulation in its quality and mass, — this looks like a contradiction, though its author may regard it as only a difference of stress and of degree. Of the two attitudes, the active involves relatively more intellect, the passive more emotion. But all intellection involves abstraction of some kind and degree; it implies tracing the relations which constitute an object. One's attentive efforts cannot well be concerned with mere feeling; they have to do rather with the structural content of music.

Music is a concrete organic form, of course, and not a mechanical union, effected by the composer, of mere abstractions. It follows that æsthetic pleasure, in the narrow sense, is conditioned by the perception of the unique individual unity. And no doubt this helps explain why one who goes to music for enjoyment fails to notice some abstract likenesses between different pieces which are patent to the curious scrutiny of the student, for their interests differ. It is true that the phases of music are wholly transformed through their artistic union, that the abstract, as such, does not exist in the concrete, and that analysis in this field, as throughout mental life, involves in some sense the destruction of the original unity. But here the real test and criterion of the value of analysis reveals itself. Æsthetic validity belongs to such abstract analysis as tends to produce a new sense of concrete unity and beauty enriched because altered by this very process from a relatively simple unity into a complex totality. The totality, whatever its structure and however ecstatic

its emotion, embodies the significance of previous unities, whether or not these were appreciated æsthetically at the moment of their psychic existence.

In a musical composition of any length, every phrase of independent beauty can be appreciated as it passes. But it is not absolutely independent, and further beauty is revealed when one detects the connecting links between the smaller units. Their significant similarity in melodic movement is often connected with rhythmic differences. Plenty of instances of this kind could be pointed out in modern music. The danger to enjoyment here is not from analysis, for this decidedly helps, but from want of synthesis. There is no appreciation of music whatever that does not alter the given beauty and transform the stimulus. Even the unity of the brief phrase is not merely given but in part constructed by the auditor ; and in relation to this phrase the æsthetic moment *par excellence*, the emotional sense of its unity and meaning, is not in its appearance strictly concomitant with the developing objective unity. This means that even within these narrow limits of duration the mind must do some work without immediate returns. And how much more is this true in proportion as the unity is long and complex! To suppose that every instant of this development must be characterized by heightened emotion is absurd, and to deny that those more intellectual instants, when the mind is scrutinizing and meeting a problem, are an essential portion of the æsthetic attitude as a process, seems arbitrary.

By way of caution it should be added that the question regarding outlines is not only whether their content is a set of images filling out a particular melodic, rhythmic, or dynamic form, but also whether such outlines function as controlling factors and often as conscious checks, whether their meaning is embodied in more or less con-

scious habits. Cases of conflicting or divergent association are best explained by recognizing such habit units in the total complex. When two phrases are identical in all respects save dynamic quality, the first being forte and the second diminuendo, the tendency is to make the second an exact repetition of the first as long as the habits are not differentiated, and this may depend on observing certain differences in context which make a demand for dynamic change. The fault is readily corrected when the dynamic outline (always in some of its connections, part of which are relevant and part irrelevant) is given sufficient attention and so readapted.

Both the importance and the possibility of outlines is exhibited by a common and useful method of teaching music to children, according to which the pupils are to study the verses, rhythm, and melody of a new song separately. They swing or beat out the rhythm or embody it in monotone. The melody is studied by reading and practicing the various intervals and transitions therein involved with frequent explicit reference to the scale. It may surprise some to find how much of the spirit of æsthetic or artistic joy children can bring to such exercises, but this need not be insisted upon as a condition of the value of their abstraction. In giving attention to each feature separately, qualitative concepts are developed. Thus habits are formed without clashing, which in maturer experience function largely without being consciously distinguished; yet their constant recombination implies the universal.

In the mode of formation of musical concepts two extremes may be remarked: (1) (*a*) When most explicit there is a comparison of different cases and abstraction of their common element. The data are really certain habits of reaction raised into consciousness by the stim-

ulus of some need, and the result is not only a new or a modified concept, but a judgment. (*b*) A variant mode is when there is an attentive scrutiny of one case and abstraction of its interesting feature, which is later discovered in or applied to other cases. (2) At the other extreme, differentiation and assimilation on the plane of habit account for the growth of a conceptual function. But not only may this come into clear consciousness at a later stage (the apparent beginning of the concept in (*b*)), but a slight conscious guidance must be assumed at the time of each adjustment in the process of development.

Similarly, the mode in which these concepts function varies between two limits: unconscious habit, or the maximum of adaptedness, and purely theoretical abstract judgment, representing the maximum felt need of readaptation and systematic attempt to that end. Neither extreme has much of any place in appreciation, but there is a nearer approach to the habit side. The conceptual function is stimulated by musical examples; and when there is clear conception at the time of listening it is usually due to some structural device that attracts the attention from its familiarity or novelty or difficulty, for the familiar or reiterated may readily provoke the question *why*. Thus the occurrence of the scale form as a melodic motive, the repeated indication of the keynote (or sometimes its concealment by strange transitions), and some striking alteration of the rhythmic figure may serve as stimuli. Indeed various emotional interests may help attract conceptual attention to structure.

III

In this section certain phases of musical conception that have already been suggested must be discussed. The following closely related questions will require attention:

(1) What is the place of imagery, and (2) what the place of feeling and habit in musical conception? (3) Are these concepts concrete or abstract? and (4) qualitative or quantitative? (5) What is the difference between thinking *in* and thinking *about* music? and (6) is musical thought to be characterized as immediate or mediate?

1. A study, impossible in this article, of the psychological and logical problems of correct intonation would show that the significance and the actual content of a tone are not always in precise agreement; that a correct image need not be substituted for a false pitch in order that its musical connections be duly appreciated; and that one and the same content may in some cases have two different meanings that are both valid, a case somewhat analogous to the figure of speech or the pun. Yet obviously there is a limit to this possible discrepancy between structure and function. Again, it was pointed out above that the functioning of guiding concepts and of musical outlines and the process of recognition through these and other concepts do not demand the presence of a tonal image or series of images. For instance, it is said that a given melody may *have* a primary tonic though such a tonic is not found as one of the actual series of presented pitches; for in this case the tones that are presented invoke the musical imagination, working according to the laws of musical structure, to supply the missing tonic. If this means a demand, not to correct the intonation of the tone which purports to stand for the tonic, but to fill out through imagination a scale position unoccupied during the progress of the melody, it is doubtful whether actual music demands this of the listener. In other words, it is doubtful whether any melody which is felt as complete, unitary, and beautiful essentially depends upon and implies a fundamental tone that pretends to no

place in its structure. But if the proposed theory be admitted, it is then unnecessary to posit the existence of atonic melodies whose adequate musical meaning does not depend upon the reference of all its tones to one and the same fundamental.[1] No decision of this question is here offered. But we would suggest that if a melody has a tonic, whether actually given or only implied in its structure, the appreciation of the tonic's value at any time does not depend upon the presence of any vivid auditory image of it.

A recent experimental study on tonal images and judgments has some bearing upon our musical problem.[2] A few conclusions of this research may here be cited: (*a*) The auditory image is but a part of the memory image of tone; it is supplemented by images from other modalities. (*b*) The auditory image wanes after two seconds and may be gone at sixty seconds. (*c*) The supplementary images may aid as identifying marks when the auditory core has disappeared. Judgments of identity or difference between pitches may thus (*d*) be independent of the presence of any auditory image, or (*e*) be aided by an unnoticed auditory image, as in assimilative recognition; or (*f*) be quite dependent upon a clear auditory image. "The deliberate use of the image as a standard of comparison is a more complicated device, a roundabout path indicative of obstacles, uncertainty, and hesitancy," and its results are comparatively uncertain.

It should be remarked that in such experiments as yield these conclusions the conditions are made very simple, while in musical experience they are very complex; that much finer sensory discriminations are called

[1] Meyer asserts the existence of such atonic melody. Cf. his *Contributions to a Psychological Theory of Music.*

[2] Cf. Whipple, in *American Journal of Psychology*, vols. xii, xiii.

for in the experiments than in ordinary musical experience; and that the purpose of the experiments is to examine and test an intellectual function, while musical thought aims at a higher realization of æsthetic values. Thus the two cases are not quite parallel. Thought having immediate value function is more apt to employ imagery, other conditions being equal. The constant presentation of new auditory sensations in music tends to strengthen and prolong the life of those images, such as the tonic, which have the most intimate and numerous connections with the new material; while in the competition other images, in proportion as their meaning is subordinate in the melody, are driven from the field. This remark applies rather to single images than to series or groups, for the conscious significance either of a phrase or of a melodic outline may be great though its foundation in imagery is very apt to be absent. On the same principle climactic tones and tones important as transition points tend to be strengthened, within certain limits, as images.

Conclusion (*f*) above shows that in music images are more prominent when one's attitude is questioning, when values are not well ascertained. In proportion as certain connections of pitch are familiar and no difficulty is felt about them, clear images would drop out. Even here, however, it should be remembered that the attitude of the musician (value-searching and finding) tends to sift out his imagery and to strengthen much of it because it is a sign of value; *i. e.* musical habituation may involve a deepening of the value-searching consciousness and a strengthening of overt memory, and not a mere elimination of images.

The need of auditory imagery when musical thought is especially problematic is exemplified in one's early attempt fully to appreciate a harmonized melody from the

score without rendering it on an instrument. Whether one hums, whistles, or sings the air, or attempts a quite silent reading, there is a demand for the simultaneous imagery of two or more tones. At one stage of practice, at least, the musical values are not realized through visual attention to the notation, however active thought may be in tracing relationships. One must hear with the mental ear the entire musical structure. As this feat, even in case of the simplest harmonies, may be at first a difficult one, a keen activity of other senses, visual and kinæsthetic, may be called forth as associative supports of auditory imagery; and appeal may be made to the device of a rapid succession of tones as a substitute for their strict simultaneity, until by the aid of incipient movements of execution the right auditory imagery may be aroused and established. As time goes on, some of the motor and kinæsthetic elements may be eliminated, until auditory images are more directly excited by the visual stimuli. Whether for some temperaments and at a later stage of maturity musical satisfaction might be independent of any immediate auditory content, either of sensation or of image, cannot be positively asserted; but it is conceivable that the visual symbols might arouse such a rich intellectual content (the insight into musical structure) as to awaken the æsthetic sense of value.

It is no doubt true [1] that, other things being equal, the intensity of emotion decreases as percepts and images give place to abstract concepts. But this does not deny that a steady interest and a quiet sentiment may attend the less imaginative type of thinking which, because of the keenness of abstract insight, may at intervals be reinforced by strong emotional thrills. Nor can it be denied that this type of feeling may be æsthetic.

[1] Cf. Ribot, *Psychology of the Emotions*, English translation, p. 317.

2. Enough has been said above under the topics of the formation and functioning of concepts and the conditions under which musical imagery is employed to show that the habit aspect of thought is prominent in music. Indeed, every concept is an expression of habit or its readjustment, while every habit embodies the value of a concept. It must not be supposed that habit means always the elimination of high types of consciousness. There are habits of feeling or thinking as well as of movement. A concept is a complex affair, having its novel and its familiar aspects; and it may at once occupy part of one's attentive interest and extend its roots down into the depths of that marginal region dominated by subconscious habit. In listening to music the attention is not occupied solely by auditory sensations; it is their *combination* that is striking for its novelty, its strangeness, its beauty, its exemplification of this or that principle or meaning. This combination is an objectified and individualized concept, and its appreciation involves the conceptional function; that is, the adaptation of a habit to a particular case. The combination is not a mere physical datum, but is dependent on organic and mental conditions. Even when long familiarity has shaped one's reaction to it into a specific habit, it is, as it were, a physiological assumption which remains to be tested by each new case; and the feeling of the test is a conceptual feeling, as is also the resulting satisfaction.

That which functions conceptually in appreciation is thus a habit, an apperceptive mass, a subjective generic form correspondent to the form of combination objectified in the music. This form or habit may be structurally composed, in part at least, of (*a*) musical imagery, auditory, kinæsthetic, or visual; (*b*) extra-musical ideas, verbal or concrete; (*c*) feeling or emotion, including pleasure, pain,

and feelings of tendency or activity; or (*d*) as activity it may be the subconscious aspect of the appreciative process and so far forth structurally indescribable.

It has been shown above that the concept may involve a feeling of tendency in a certain direction, a feeling of the limit of such musical movement, and a feeling of possible variation within limits. The relation of a pitch to the tonic, the shake, and all variation from correct intonation may be examples. When there is a feeling of tendency its direction need not be abstractly defined as up or down, toward or away from, increase of complexity or resolution into simpler harmony, in order that it be a concept; the nature of the strain sensations and other feelings constituting it may suffice to differentiate it and render it more than a mere vague, meaningless feeling. So, too, its limits need not be imaged in advance; if felt at the right moment as either resting-points or counter tendencies, the concept is thus defined.

3. The distinction was above made between the individual concept, as of this unique melody, and the universal concept, exemplified when some genetic feature or outline is abstracted from the total musical movement. But the distinction that now concerns us is that between a narrower and a broader view of the very nature of music. The one would regard musical appreciation as an isolated activity of the mind whose sole content and meaning consists in tones and their relations; the other views it as continuous with human life at large and in significant connection therewith. So two contrasting theories are found in musical æsthetics: (*a*) that of the intellectual formalist and (*b*) that of the idealist or symbolist. For the latter, music has extra-musical values and expressive powers. Tones in their structural relationships have vicarious value; they stand for spiritual relationships. But

these are of a general and abstract kind, and therefore not readily or adequately to be stated in linguistic terms. From this point of view music is the pure form of our inner life. This bare form is objectified in tonal material and thus given an artistic value. But as appreciated it is apperceived by subjective forms in the hearer's mental make-up, forms which, as compared with the objective forms, may have a different concrete filling of visual and other imagery and a broader meaning. Auditory sensations are but a fraction of the richness of our inner life; yet, when combined according to the universal laws of the mind, they function as substitutes or symbols and serve to arouse further mental content.

"To think concretely is to represent general relations as embodied in particular instances;"[1] or in a related sense, it is to think reality or real objects in their wholeness, and not sacrifice this to some one or more important aspects.

a. Now for the musical formalist the standard of concreteness is the whole unique piece of music viewed as a complex of tones in various relations. Judged by this criterion, he thinks abstractly in proportion as his attention isolates some one feature like the rhythm, which may also have a universal character. But since, whether as performer or listener, he will in the main regard this feature as embodied in the given instance, since tone still remains the substance and material of his thought, it is to that extent concrete.

b. For the symbolist, on the other hand, the standard of concreteness is found in human experience at large or the nature of spirit. The structure of music embodies universal relations that obtain through all experience. Under this test musical thought is concrete only in case

[1] Baldwin's *Dictionary of Philosophy*, article "Concrete."

of a complete fusion of the subjective mood and imagery with the objectively given movement, only when the presentation has as its subjective aspect an insight into and feeling for the richness of life. But the presentation may be distinguished as a system of signs, a language which stands primarily for a system of abstract relations. In the more introspective and reflective hearing of music, then, one may devote attention to this language and its abstract meaning; or, on the other hand, the mind may be given up to the mere subjective play of feeling and imagery, abandoning all notice of the musical movement and structure. In both the latter cases thought is abstract according to the standard of the idealist.

4. In order further to determine the nature of musical concepts, a distinction should be drawn between (*a*) popular, (*b*) scientific, and (*c*) æsthetic concepts, which may reveal also the relative place of qualitative and quantitative determinations in musical thought.

a. The popular concept is above all practical; it has reference to the action of one's self or others or to those phenomena in the world which manifestly affect us; it is thus often embodied in plan or purpose. At the same time, it may be so related to individual satisfaction as to have an æsthetic as well as a moral value. Among its constituents are images, qualitative relations, feelings, and value attitudes, so far as these serve to mediate the appropriate reactions; but these become gradually supplemented by ideas of quantitative relations. It exhibits different stages of development. For instance, in the popular concept of the color red, the experience or object is at first relatively unanalyzed. Red is a unique quality, though regarded as one of the class color. It is itself a class idea, denoting any of the various shades or tints of red; and each of these is a unique quality, though all together are

capable of a serial arrangement in which indefinite ideas of more and less early play a part. At a higher stage there is a more definite determination of the serial order as quantitative by reference to a standard series of objective color tones as a pattern. The number of members in such a series may be arbitrary, but by reference to it any new instance of red would receive a numerical status. There may further develop a quantitative concept of the causes and relations of any specific qualitative effect, by reference either to the mode of mixing paints, etc., or to the extent of red space which will have a desired effect. While through such means the general concept gains in specification, yet in itself red is still taken as a unique quality.

b. The scientific concept functions immediately to enable the intellect to classify and explain the fact, *e. g.* red, in the most universal manner, to grasp it along with other facts in the most comprehensive and unitary system. Its ultimate function, however, is to make possible a more adequate control of the reactions of humanity to the phenomenon ; *i. e.* it is the function of the popular concept perfected. Nor is the distinction between the scientific and the practical attitudes or methods rigid. Already in the latter we have seen a growing analysis of the crude whole of experience into aspects, and therefore some abstraction from the immediate felt value of the total. Such analysis and abstraction are in the scientific concept more extreme and disinterested, yet while the effort is made to keep personal bias and feeling out of its structure, it tacitly assumes its adaptation to the essential needs of humanity. Such a theoretical notion shows the common ground of red and other colors and finally other kinds of quality, such as sound, in reducing their differences to quantitative, measurable differences in a mode of motion.

It thus substitutes a formula for a set of images and feelings. But all qualities and values are not eliminated from the formula. For both the ultimate units assumed in the scientific account and their orderly relation or unity are qualitative. While their relations have become measurable, such measuring means a checking of one qualitative experience by another taken as a standard. Indeed the aim of the abstraction is in part a more adequate valuation and feeling. So the scientific definition of the predicate (as red) will in the end be able to contribute to and determine the value of the subject (red objects in human experience).

c. The function of the æsthetic concept in its primary forms is to secure an immediate satisfaction; it involves a minimum of the feeling of tension with law or standard. In its later developments this felt tension may be a factor, when the concept's function is to comprehend, secure, and enrich an effect which without the aid of more elaborate concepts would escape appreciation. In other words, it comes to aim at the maximum of possible value which is in part determined by a complex standard and laws. The æsthetic is rooted in the popular concept. Its notion of red, for example, is at first that of a unique and pleasing qualitative experience. Red effects are correlated with other color effects and partially differentiated from them as warm or stimulating colors. The higher development of the æsthetic feeling for relation (including contrast, harmony, and discord) involves a keener discrimination of values and a more idealized feeling of the value of red. Red is no longer so isolated as an experience, but it is felt, imaged, or thought as belonging in certain typical connections and as *not* belonging in others. The experience is largely qualitative, and involves a sense of wholeness, red being one, though the chief, feature in this whole.

This notion is still further specified through the supplement first of quantitative ideas of how the effect is physically obtainable (compare the later stage of the popular concept), and then of æsthetic laws both broader and more precise which reveal the grounds of the effect on the one hand and the criteria of value on the other.

The notion of red has been instanced because in its different degrees of completeness it may have chiefly practical, artistic, æsthetic, or theoretic functions. It is easy to substitute a musical example, but this need not be here worked out save for the higher æsthetic concept. The trained musician will have such a complex, relational concept of the leading note, for instance. Though this be sensed or imaged, it is felt in its proper relations. It is no mere synthesis either of apprehension or of perception, to adopt Lotze's distinctions.[1] That is, it is not merely lumped together with other tonal values in one vague consciousness, nor is its place in the movement or series one of mere succession; its relations are not exhausted in the before-and-after relation. Rather are its relations appreciated as based on certain grounds (the structure of the scale, the laws of melody and harmony, etc.), whether these be thought abstractly or not. *Therefore* the tone is felt as leading tone; as such predicate it gains a definite import in the form, and the hearer has discovered a partial rationale of the effect. Such an attempt in musical experience to grasp the effectiveness, to trace it to its cause, and so to control its realization, though still retaining imagery and feeling, exhibits its similarity to scientific conception, and indeed depends indirectly upon that for its success.

For though the popular, scientific, and higher æsthetic concepts are distinguishable, they are bound together in

[1] Cf. *Logic*, English translation, vol. i, p. 38.

the *total* musical experience of the race. Æsthetic concepts often do not rise above common-sense methods, only (as in music) they have regard to appreciation rather than to conduct or phenomena in the every-day world, and thus they idealize their material, making out of it a unique self-articulated tone world. The concepts of the performing artist would exhibit further similarities to the concepts that function in ordinary practice on account of their common relation to doing. Further, the most technical and scientific concepts ultimately react into appreciation for its advancement, though not necessarily in the individual life. For musical æsthetics is distinct from mathematical physics, though the latter may supplement the former. So far as the exact ratios of rhythmic measures, sound vibrations, overtones, etc., do not enter into the musical consciousness, they are not directly concepts of musical æsthetics. But even such technical mathematical concepts may conceivably have a value in training one to a more discriminating appreciation and performance. For if mathematics, physics, and physiology have any power to modify or supplement psychological law and thus musical æsthetics, then through this intermediation they may and ought to affect one's attitude to music. It may be that only by an appeal to mathematics can a clear and adequate insight into musical structure be gained, and yield laws that shall exhibit the significance of our actual musical experience. If that be the case, then mathematics is a means of gaining musical control. But neither composer, performer, nor hearer will have in mind such mathematical determinations; these are retranslated into relations of quality or psychological quantity (such as measurable distance in the scale), for in music itself one is never directly concerned with physical quantity (such as vibration rates).

Thus in most of the directly æsthetic and artistic activity and even in much musical practice, the requisite is emotional thought, vital interest, imaginative sympathy, soul; therefore the more popular and æsthetic concepts. But there is a sphere of activity for the more quantitative and scientific mode of conception also in the systematic study of musicians, in the development of musical tradition and systems, and in the invention and perfection of instruments and technique. Nor can it be doubted that all this reacts ultimately and with power into the inner musical life of man.

5. A distinction should be made between thinking *in* music and thinking *about* music, but this will require little elaboration after the foregoing paragraphs. Universal meanings characterize each type of thought. In the former these meanings are embodied in auditory, kinæsthetic, and other sensations or imagery having direct material value in the musical experience; in the latter they are suggested by verbal, numerical, or other symbolic terms, — symbols which have no such direct value, but are external to the actual musical activity. Thus the former thought mode is largely concrete and is strictly a part of the æsthetic process, while the latter is more abstract and intellectual in its nature. But though their distinction is readily formulated in theory, in practice a sharp line cannot always be drawn between them. Thus, in different degrees, any one of the symbols 2-3, tonic-dominant, C-G, and their staff representation, may, as a mode of thought, shade over into or be fused with the feeling of actual relationship between two tonal impressions or images.

Recurring to the feeling of tendency explained in (2) above, it is not *essential* to the constitution or functioning of thought *in* music that this feeling be defined as

regards either its direction (*e. g.* accelerando, up in pitch, away from discord) or its limits (in image or idea). Such definition *may* be a phase of thought *in* music, or again it may belong wholly to the sphere of thought *about* music. The structure of the former may consist mainly in the peculiar quality of the strain sensations and the feeling of check to or satisfaction of the tendency: these may be sufficient to define respectively the tendency and its limit. In thus far the thought appears fundamentally qualitative in its nature. Such thought is present in the actual sensuous embodiment of these feelings as one performs or listens.

6. The question about the immediate or mediate nature of musical thought may well be presented by considering Gurney's views on musical form and our appreciation of it, with special reference to the distinction between briefer and longer musical movements.[1] His ideas are in substance as follows: The real beauty of music is embodied in the shorter unit of movement, such as a melodic phrase. This, the essence of music, is appreciated by a separate musical faculty, which is out of all relation to the intellect. The various relations (such as likeness, difference, contrast, balance) between phrases *may* be cognized intellectually; but the phrases, which are unique and individual, are of most importance musically. Plan or conscious design can be attributed only to the more comprehensive unities. The individual part fulfills no plan and is inspired by no end. The formal connection between phrases may be more or less cogent and organic, it may involve rational principles; therefore the corresponding subjective attitude may involve the exercise of thought. But the beauty of the single phrase is wholly individual and inexplicable, and is apprehended by the

[1] *Power of Sound*, pp. 190-206 *et passim.*

unaided intuition. The listener's mental process is here that of immediate apprehension, while there it includes reflective or mediate thought.

But because the essence of beauty is revealed through the former, it appears that intellectual processes, whether of analysis or synthesis, have no æsthetic validity. If the interconnections between phrases or the more inclusive forms have any effectiveness or worth in themselves and so contribute at all to the sum total of beauty (for from this standpoint there is in an extended piece only an aggregation of successively appearing beauties and not a complex beauty of the whole), such value resides wholly in their immediate, individual aspect; it is merely given to this mystical musical faculty and in no wise determined by thought, which is concerned with universals and works under the guidance of rational principles. In no case does appreciation employ non-musical categories. Regularity of tempo and rhythm, fixity of pitch, and other factors of musical form have an immediate instinctive value rather than a reflective one. Musical synthesis does not involve intellect or culture: "And so far, in these all-essential and characteristic forms, the general intellectual faculties, whether imaginative or logical, seem to have no place at all: the unique faculty of coördinating the notes and perceiving the group as a whole may be possessed by the most dunderheaded boor."

These views certainly involve a partial truth, but this is present only by implication and is either neglected or rejected by Gurney in the main. Yet the pressure of its demands is such as to force him, in the further description of his position, to statements really incompatible with the dualistic theory of thought and intuition just outlined. For first, as to the subjective side, it appears that the musical unit cannot be merely given. In proportion as

he really appreciates; the listener is mentally active rather than overpowered by his object. His attitude can hardly be called one of *simple* apprehension, for his mental content is a complex unity. Though *known* relations have no place in his sense of beauty, the importance is admitted of *felt* relations based on associations due to past experience. Evidently if the development of musical intuition depends on experience, the utility of the experience will depend to some extent on the part played in it by cognitive aspects. The intuition is an act of synthesis, a group*ing*, coördinat*ing*, phras*ing*; and as its content includes distinguished terms and felt relations, this implies an act of analysis. As regards the objective side, it is maintained that musical form is organic and involves strict interdependence of parts, that form is present in proportion as the sequence and mode of connection is cogent, and that therefore the notion of form is more applicable to the smaller than to the larger unities. However individual and transcendent of entire comprehension or explanation a form may be, then, it cannot be regarded as merely particular, as exclusive of all universal characteristics. As individual form, it is the unity of particular and universal.

The inference from such views on musical form, regarded either as the subjective attitude or as the object, is that form is not a simple datum, for that would be the mere material of appreciation, but a complex process. Apprehension is complex, even in its structure, and patently so in its function and meaning. It has its immediate and mediate aspects which are never entirely divorced. If the unity, meaning, and beauty of a phrase be summarized in a thrill of feeling and heightened pleasure, this is not mere pleasure nor mere immediate feeling, nor is it the whole of appreciation. Were that the case, all musical values would be alike to one, or rather the

very possibility of their comparison and adjustment to a standard would be impossible. This feeling is an abstraction as compared with the real process of appreciating, and it is but a sign or a portion of the value that has been worked out in part by the intellect. The feeling as immediate is rooted in and organically continuous with mediating processes preceding it, and its meaning should not be sacrificed to its bare content. To divorce them is not only to be untrue to the essential nature of the process, but to plunge one into insuperable theoretical difficulties. The two sorts of musical unity, that within the phrase and that between phrases, are *not* different in kind, therefore, but only in degree; just as apprehension and reflection are not distinct faculties or modes of mental activity, but both involve, though in different degrees, the two factors of mediation and immediate feeling.

VII

PRAGMATISM AND KANTIANISM

William Longstreth Raub

The doctrines grouped under the name of pragmatism are among the most important now under discussion in philosophy. Although differing in details, as expressed in the radical empiricism of Professor James, the immediate empiricism of Professor Dewey, and the humanism of Mr. Schiller, its exponents agree in proposing a practical criterion of truth, as that which works, which satisfies our needs. They consider reality as something given in experience rather than existing outside of it, and truth as expressing a relation between different parts of experience rather than a relation between our ideas and a hypothetical extra-experiential reality.

The current discussions of the position are directed almost entirely to the question of its validity, either as a logical or as a psychological theory. This question, however, cannot be satisfactorily answered until the position has been more definitely formulated, as some of the pragmatists themselves acknowledge that they are not yet clear as to its meaning.

But the question of the truth of pragmatism is not the only aspect of the doctrine that is of interest to the philosopher. The discussion of its place in the history of philosophy has more than a merely historical value. Much of the vagueness and misunderstanding of the current discussions might be avoided if it were more clearly under-

stood that the main features of pragmatism are not new and that its more important doctrines have already been thoroughly discussed. Its principal defenders treat it as an essentially new position, and seem to consider that its appearance is to mark the beginning of a new era in philosophic thought. They acknowledge that suggestions of its main features may be found in the writings of earlier philosophers, but seem to regard these as simply unconscious anticipations of the truth. But among those of its critics who grant it any validity this claim for its novelty has not been favorably received. Various writers have shown that the main problem of pragmatism is common property in philosophy, and that the different features of the solution which the pragmatists offer to this problem have been consciously advanced by various philosophers from Plato to Wundt. There would seem, however, to be a need at the present time of insisting more emphatically upon the similarity between pragmatism and the Kantian doctrines of experience and knowledge, a similarity that will probably be better recognized as a more thorough criticism forces the pragmatists to formulate their doctrine more definitely. That the more important features of pragmatism, in so far as it is a valid theory, are completely expressed in the Kantian philosophy, is the thesis which this paper undertakes to defend.

I

Professor James, Professor Dewey, and Mr. Schiller are recognized as the leaders of the pragmatist movement. Each has given to his own theory a particular name, but each acknowledges himself a pragmatist and gives his allegiance to the main doctrines of the others. Professor James in his radical empiricism emphasizes the pluralistic

aspect of experience,[1] Professor Dewey in his immediate empiricism its realistic aspect,[2] and Mr. Schiller in his humanism the purposive character of knowledge.[3]

Pragmatism is considered to owe its origin to the breakdown of the representational view of knowledge, the belief that science expresses truths that are exact copies of non-human or trans-empirical realities.[4] The new meaning of truth, which it would substitute for the old, can be understood only in the light of the pragmatist theory of experience. For Professor James, "Experience is a process that continually gives us new material to digest. We handle this intellectually by the apperceiving mass of beliefs of which we find ourselves already possessed, assimilating, rejecting, or rearranging in different degrees."[5] The general theories of experience held by Professor Dewey and Mr. Schiller agree substantially with this.[6] The views of the three writers regarding the details of the steps in this process are expressed in a somewhat fragmentary form in recent discussions.

Pure experience is, according to Professor James, the stuff of which everything is composed,[7] the stuff that is furnished to us in the instant field of the present,[8] and

[1] *The Will to Believe*, pp. vii. ff.; "A World of Pure Experience," *Journal of Philosophy, Psychology, and Scientific Methods*, i, p. 534.

[2] "The Postulate of Immediate Empiricism," *ibid.* ii, pp. 393 ff.

[3] *Humanism, Philosophical Essays.*

[4] James, "Humanism and Truth," *Mind*, N. S. xiii, No. 52, p. 459; "The Essence of Humanism," *Journal of Philosophy, Psychology, and Scientific Methods*, ii, p. 115; Dewey, *Studies in Logical Theory*; Schiller, *Humanism*, pp. 44 ff.

[5] "Humanism and Truth," *Mind*, N. S. 52, p. 460.

[6] Dewey, "The Postulate of Immediate Empiricism," *Journal of Philosophy, Psychology, and Scientific Methods*, ii, pp. 393 ff.; "The Knowledge Experience Again," *ibid.* p. 710; *Studies in Logical Theory*, ch. i–iv; Schiller, *Humanism*, ch. xi.

[7] "Does 'Consciousness' Exist?" *Journal of Philosophy, Psychology, and Scientific Methods*, i, p. 478.

[8] *Ibid.* p. 485.

that comprises not only our percepts but also the relations that connect our percepts.[1] This immediate experience is not to be considered as representational, phenomenal, or in any sense unreal. "Immediate empiricism," says Professor Dewey, "postulates that things — anything, everything, in the ordinary or non-technical use of the term 'thing' — are what they are experienced as."[2] The Zöllner's lines are experienced by us as divergent; that is, "the lines of *that* experience *are* divergent: not merely *seem* so."[3] "The only reality we can start with," says Mr. Schiller, "is our own personal, immediate experience. We may lay it down, therefore, that *all immediate experience is as such real.*"[4]

But in the fluency of this immediate experience there are disappointments and uncertainties, and the reflective intellect discovers in it incomprehensibilities.[5] This unsatisfactoriness of the perceptual experience leads us to the creation of a second form, the conceptual experience, in which we think of things as existing in an objective order, different from our perception of them.[6] The clearest statement in the pragmatist literature of the motive and implications of this transition from perceptual to conceptual experience is given by Mr. Schiller. "We start, indubitably, with an immediate experience of some sort. But we do not rest therein. If we could, there would be no further question. Our immediate experience would suffice;

[1] "A World of Pure Experience," *ibid.* i, p. 534.

[2] "The Postulate of Immediate Empiricism," *ibid.* ii, p. 393.

[3] *Ibid.* p. 397.

[4] Schiller, *Humanism*, p. 192.

[5] James, "A World of Pure Experience," *Journal of Philosophy, Psychology, and Scientific Methods*, i, p. 562; "The Thing and its Relations," *ibid.* ii, p. 29.

[6] James, "Does Consciousness Exist?" *ibid.* i, p. 481; "How Two Minds can know One Thing," *ibid.* ii, p. 177; Dewey, *Studies in Logical Theory*, ch. ii.

it would be the sole and complete reality. . . . But our experience is woefully discordant and inadequate. In other words, our experience is *not* that of a perfect world. We are neither disposed, therefore, nor able, to accept it *as it appears to be*. Its surface value will not enable us to meet our obligations: we are compelled, therefore, to discount our immediate experience, to treat it as an appearance of something ulterior which will supplement its deficiency. We move on, therefore, from our starting-point, taking our immediate experience as the symbol which transmits to us the glad tidings of a higher reality, whereof it partly manifests the nature. The 'realities' of ordinary life and science are all of this secondary order: they rest upon inferences from our immediate experience which have been found to work. And the process of reaching them is everywhere the same: we experiment with notions which are suggested to our intelligence by our immediate experience, until we hit upon one which seems to be serviceable for some purpose which engrosses us. And then we *declare real* the conception which serves our purpose, nay more real, because more potent, than the immediate experience for the satisfaction of our desire." [1] "It must never be forgotten that the immediate experience is after all in a way *more real*, i. e. *more directly real*, than the 'higher realities' which are said to 'explain' it. For the latter are inferred and postulated simply and solely for the purpose of 'explaining' the former, and their reality consequently rests for us upon that of the former." [2]

This purpose or need which engrosses us and for which

[1] *Humanism*, p. 193. Cf. Dewey, *Studies in Logical Theory*, ch. iii.

[2] *Humanism*, p. 195. Cf. James, "A World of Pure Experience," *Journal of Philosophy, Psychology, and Scientific Methods*, i, pp. 541 ff.; Dewey, *Studies in Logical Theory*, ch. iv.

the conceptual reality seeems to be serviceable is not simply that arising from the demand for an "explanation." Professor Dewey considers the test of thought to be the harmony or unity of experience actually effected,[1] while according to Professor James the reconstruction of experience is to the effect "that we may the better foresee the course of our experiences, communicate with one another, and steer our lives by rule. Also that we may have a cleaner, clearer, more inclusive mental view."[2] Mr. Schiller considers the purpose as still more inclusive, *i. e.* "to construct out of the material we start with a harmonious cosmos which will satisfy all our desires (that for knowledge included)."[3] "We conceive the axioms as arising out of man's needs as an agent, as prompted by his desires, as affirmed by his will, in a word as nourished and sustained by his emotional and volitional nature."[4]

This "objective reference" or reorganizing of experience is brought about by the application to perceptual reality of certain principles. "The world is experience plus connecting principles."[5] These "notions," "apperceiving ideas," "connecting principles," or axioms are postulates which we have made in response to our needs and desires. They are "necessary" only in the sense that we need them as means to our end.[6] Most of them, such as those of one time and one space as single continuous receptacles, of causality and of the permanence of matter, have served their purpose for so long a time that they may now be considered common-sense traditions of the race. But though they are only postulates, their use by us is not a matter of our caprice. "They proved of such sovereign

[1] *Studies in Logical Theory*, p. 85.
[2] "Humanism and Truth," *Mind*, N. S. 52, p. 461.
[3] "Axioms as Postulates," *Personal Idealism*, p. 55. Cf. p. 57.
[4] *Ibid.* p. 86. [5] *Ibid.* ch. i. [6] *Ibid.* ch. iii.

use as *Denkmittel* that they are now a part of the very structure of our mind. We cannot play fast and loose with them. No experience can upset them. On the contrary they apperceive every experience and assign it to its place." [1] "The great axioms or postulates have become so ingrained in all our habits of thought, that we may practically rely on them to stand fast so long as human thought endures." [2] And Professor James considers that they may become so thoroughly "a part of the very structure of our mind" that we may have more confidence in them than in experience itself. "If a novel experience, conceptual or perceptual, contradict too emphatically our preëxistent system of beliefs, in ninety-nine cases out of a hundred it is treated as false." [3]

Reality is then for us something existing within experience, though not necessarily entirely within perceptual experience. As immediate realities "things are what they are experienced to be." [4] As mediate realities they are what we construct. "For us reality is an accumulation of our own intellectual inventions." [5] It means "the other conceptual or perceptual experiences with which a given present experience may find itself in point of fact mixed up." [6] The reality of things means that "we submit to them, take account of them, whether we like to or not." It is independent in that "there is something in every experience that escapes our arbitrary control." Whether experience itself is due to something independent of all possible experience is a question that prag-

[1] James, "Humanism and Truth," *Mind*, N. S. 52, p. 561.

[2] Schiller, "Axioms as Postulates," *Personal Idealism*, p. 93.

[3] "The Essence of Humanism," *Journal of Philosophy, Psychology, and Scientific Methods*, ii, p. 118.

[4] Dewey, "The Postulate of Immediate Empiricism," *ibid.* ii, p. 394.

[5] James, "Humanism and Truth," *Mind*, N. S. 52, p. 462.

[6] *Ibid.* p. 474.

matism declines to answer.[1] Even were there such an independent reality, we could know nothing about it.[2] On this basis the pragmatist meaning of truth appears as "the relation of less fixed parts of experience (predicates) to other relatively more fixed parts (subjects); and we are not required to seek in it a relation of experience as such to anything beyond itself."[3]

The pragmatist criterion of truth is usefulness or satisfaction. That is true which works, which satisfies our needs. Professor James defines the true as that which gives the maximal combination of satisfactions.[4] For Mr. Schiller it is the useful, efficient, workable.[5] "The true is useful and the useless is untrue."[6] But the nature of this satisfaction the pragmatists do not clearly define. Professor Dewey indicates that it is an intellectual satisfaction in the harmony or unity of experience,[7] but Mr. Schiller and Professor James do not thus limit it. For the former, "As regards the objects valued as 'true,' truth is that manipulation of them which turns out upon trial to be useful, primarily for any human end, but ultimately for that perfect harmony of our whole life which forms our final aspiration;"[8] while the latter considers satisfaction a many-dimensional term that can be realized in various ways,[9] and the term "to be satisfactory" one that admits of no definition, so many are the ways in which this requirement can be worked out.[10] "Satisfactoriness

[1] James, "Humanism and Truth," *Mind*, N. S. 52, p. 463.
[2] Schiller, *Humanism*, pp. 9 ff.
[3] James, "Humanism and Truth," *Mind*, N. S. 52, p. 464.
[4] "Humanism and Truth Once More," *Mind*, N. S. xiv, No. 54, p. 196.
[5] *Humanism*, p. 59.
[6] *Ibid.* p. 38.
[7] *Studies in Logical Theory*, ch. iv.
[8] *Humanism*, p. 61.
[9] "Humanism and Truth Once More," *Mind*, N. S. 54, p. 196.
[10] "Humanism and Truth," *ibid.* 52, p. 474.

has to be measured by a multitude of standards, of which some, for aught we know, may fail in any given case." [1]

The important features of the pragmatist position are thus, —

A chaotic *given* experience which sets us questions;

An orderly *constructed* experience which we substitute in thought for the immediate experience;

Fundamental principles or categories, "long ago wrought into the structure of our consciousness," [2] and in accordance with which the construction is made;

The necessary corollary that reality is plastic and, except as given in immediate experience, of our own creation;

The purposiveness of human thought, expressed in the "practical" criterion of truth.

II

The Kantian theory of experience is expressed in the doctrines that we have two forms of experience, the first the chaotic crude material of the senses, the second the scientific experience that conforms to law; that the first is *given* by the sensibility, the second *thought* by the understanding; that this transition from given to constructed experience is possible only by the use of the categories, which are thus the *a priori* conditions of possible (orderly) experience; that the categories apply only to objects of possible experience, and that consequently we can know nothing about realities existing outside of experience; and that we use the categories in response to the highest intellectual need of our nature, the demand for sanity. These are the doctrines of Kant which express the main features of pragmatism. Behind the dif-

1 "Humanism and Truth Once More," *Mind*, N. S. 54, p. 191.

2 James, "Humanism and Truth," *ibid.* 52, p. 461.

ferences of phraseology there is an essential identity of thought, an identity which a comparison of the details of the two doctrines makes apparent.

To the chaotic pure experience of the pragmatist Kant's material of perception (*das Mannigfaltige der Erscheinung*) corresponds. This is the irreducible given element of all experience. In so far as the pragmatist's immediate experience "of things as they are" includes their temporal and spatial relations, it is the perception (*Erscheinung*) of the Kantian doctrine, the undetermined object, in which the material is arranged in the *a priori* forms of time and space, but to which the categories of the understanding have not yet been applied.

In the "demand for an explanation" is the first motive for constructing an experience to take the place of the immediate experience. But this demand has its source in us, rather than in the immediate experience. We set the questions. The "inadequateness" of immediate experience appears only as we make demands upon it. The so-called "contradictions in sense testimony" are really contradictions between the testimony of the senses and what we believe they ought to testify to.

In the "Transcendental Analytic" and the "Prolegomena" Kant establishes the doctrine of a constructed experience. Nature, as the existence of things so far as it is determined according to universal laws, is of our own creation. The universal laws of nature are really the laws of thought, which we discover in experience only because we have constructed that experience in accordance with them. "The understanding creates its laws (*a priori*) not from nature, but prescribes them to it." [1] "That nature must conform to our subjective apperception — nay, even that its order must depend on this relation

[1] *Prolegomena*, § 36.

— probably sounds very absurd and strange. But if we reflect that this nature is nothing in itself but the sum total of phenomena, consequently nothing *per se*, but merely a number of mental representations, we need not be surprised that we see it subject to the radical faculty of all our *knowledge*."[1] In the "Prolegomena" Kant distinguishes between judgments of perception, which are only subjectively valid, and judgments of experience, which have objective validity. It is of the latter class that science is composed. All our judgments are at first merely perceptive judgments. It is only through the action of the understanding in the application of the categories that a judgment of perception can become a judgment of experience; *i. e.* a judgment concerning a reality in objective temporal, spatial, and causal relations.

Kant's discussion of the categories is rightly considered inadequate, but it includes those regarded by the pragmatists as serving in the reorganization of experience. Of greatest importance in the Kantian list are those of relation, — substance, causality, and reciprocity; and of these the category of causality is of prime importance in constructing a reality that will "explain" our immediate experience.

One of the greatest apparent differences between pragmatism and the theory of Kant is that in the latter the categories are considered *a priori* notions of the understanding, while for the pragmatists they are derived from experience. While many of the pragmatists' statements are open to the interpretation that the categories have been derived from the experience of the individual, where they have spoken most clearly in regard to them they leave no doubt that they consider them *a posteriori* for

[1] *Kritik of the Pure Reason*, "Deduction," sec. 2, par. 4. (trans. by Mahaffy), p. 169.

the race, but *a priori* for the individual. To grant that "no experience can upset them" because "they are now a part of the very structure of our mind," is equivalent to calling them *a priori* in the Kantian sense. Kant's criteria of apriority are necessity and universality, but universality is derived from necessity, and no more positive test of necessity is given by Kant than this to which the categories of pragmatism respond. The pragmatist does not claim that they are derived from *his* individual experience, and he grants that *for him* they carry with them necessity. As to their derivation in the experience of the race, this is a theory advanced by the pragmatist, but not established, while for Kant it is a question that lies outside of his philosophy. He is concerned not with the psychological problem of the process by which the categories have come into consciousness, but with the philosophical problem of their value to us in constructing an objective experience. The determination of this value demands the investigation of the mental processes involved in their use, but this is a problem of the psychology of the individual in the present, not of the psychology of the race in the past.

Although the categories in Kant's theory are not derived from experience, they apply only to objects of possible experience. They cannot give us knowledge of things *per se* existing outside of experience. That *Dinge an sich* exist as the cause of our sensations, is granted by Kant; he denies that through purely intellectual activity we can know anything — unless negatively — as to their character. Pragmatism does not deny their existence, but it does not discuss the question. Whether the attitude of Kant toward *Dinge an sich* is due to his uncritical retention of certain metaphysical assumptions, or to the application of the category of causality beyond

the limits which he established for it, is not material. The legitimate consequence of his position would bar him from any assertions, positive or negative, as to assumed entities not experienced. The distinction between phenomena and noumena is not logically an essential feature of the Kantian philosophy. Pragmatism and Kantianism, however, agree that the only reality that we can definitely know is a reality either given in or constructed in experience. In the final analysis the phenomena are really noumena. Truth, therefore, is necessarily a relation between different parts of experience. This conclusion is not merely implied in Kant's general discussion, it is directly involved in his negative condition of truth as the agreement of a cognition with the universal and formal laws of the understanding and reason.[1]

The pragmatist's practical criterion of truth seems at first sight to involve only the element of passing needs. Mr. Schiller's test of truth as that "which turns out upon trial to be useful, primarily for any human end," certainly suggests the satisfaction of present transitory desires, as does also Professor James's "maximal combination of satisfactions." But together with those statements of pragmatism which are susceptible of this interpretation, there are many which indicate that in some cases at least the satisfaction sought is that of the deeper, permanent demands of our nature. The recognition that one of these permanent demands is for a harmonious orderly experience is closely related to the acknowledgment of the pragmatist that the categories are the principles in accordance with which this experience is constructed and that they are now beyond our arbitrary control. How both of these classes of needs, temporary and permanent, can be used indifferently in the utilitarian test

[1] *Kritik of the Pure Reason*, Trans. Logic, Intr. iii.

of truth is a problem that pragmatism has not answered. The tendency of the discussion is toward the position that it is only in the satisfaction of permanent needs that a criterion of truth can be found. Mr. Schiller's ideal of "a perfect harmony of our whole life which forms our final aspirations," Professor James's demand for a "cleaner, clearer, more inclusive mental view" and rules by which he may steer his life, and Professor Dewey's test of thought as the "harmony or unity of experience actually effected," indicate a more or less clear recognition on the part of the pragmatists that whatever be the source of our deeper, permanent desires, whether they arise in our intellectual, emotional, or volitional nature, they find their complete satisfaction only in a rational universe. But this does not make the test of truth any less practical or less dependent upon the permanent needs of our nature. The most important feature of the Kantian epistemology is the deduction of the categories, in which Kant establishes the fact that we construct our orderly experience in response to the demands of our own nature. As the categories are the *a priori* conditions of possible experience, their use is justified only as we can justify the demands for a uniform experience. Kant's analysis of the process of construction reveals the important part played in it by the function of synthesis, in producing unity in the multiplicity of immediate experience. The highest synthesis in the construction of experience is that which produces unity of consciousness, or consciousness of the identity of self. This "transcendental unity of apperception" is sanity,[1] and is attained and maintained only in and through a uniform experience. The ultimate motive, therefore, for the use of the categories is the instinctive demand for sanity. We

[1] Cf. Royce, *Spirit of Modern Philosophy*, pp. 128 ff.

have no guarantee, however, that this demand will be satisfied, and the fact of insanity is the sufficient evidence that in many cases it is not satisfied. A rational universe is thus in the truest sense a practical postulate, and for the Kantian philosophy the ultimate test of truth is utilitarian.

The constructed, orderly experience is *my* universe, constructed *by me* in accordance with *my* laws of thought. I believe that intelligent fellow-beings exist, whose experiences are a part of my universe and with whom I communicate. But on the basis of either pragmatism or Kantianism this can be taken to mean only that each intelligent fellow-being constructs *his own* universe, and that these numerically different constructions correspond. Neither position makes possible the *action* of different individuals on each other. The problems involved in this and in the assumption that the categories are the same for all intelligent fellow-beings are not solved by Kant, but are passed on to the post-Kantian discussions. For the pragmatist they are crucial questions, of which he has not yet offered an adequate solution. Until he does offer such a solution pragmatism cannot be accepted as a satisfactory theory of experience.

VIII

THE INFLUENCE OF PRAGMATISM UPON THE STATUS OF THEOLOGY

Eugene William Lyman

It has come to be a well-nigh universally accepted notion that theology must occupy an isolated position among the sciences. Various philosophical systems have endeavored in times past to furnish theology with a foundation, and such a service is still sought by theology in many quarters. But even where this is the case, the relationship is not reciprocal; theology is not admitted to a share in the work of forming a *Weltanschauung*. It is true that many a philosophy draws material from religion, but it is religion worked into scientific form by some non-theological method. Theology itself is not expected, like the other sciences, to produce results which philosophy can neglect only at its peril. Formerly the queen of the sciences and now, whether by the revolt of its former subjects or by its own choice, alienated from their commonwealth, it has at no time occupied the position of their simple peer.

The direct cause of the situation has been that theology has been too radically unlike the other sciences in the critical point, that of method. While science as a whole, excepting only the purely formal disciplines like mathematics and logic, has been becoming more and more empirical, theology has remained frankly dogmatic. This has made possible its alliance with dogmatic types of philosophy, but has excluded it from the fellowship of science in general, a circumstance that has really hindered

it in furthering the practical mission of the church to the culture of our time. The dogmatic and the empirical methods are so fundamentally different that they render the disciplines employing them different in kind. When such a difference prevails between theology and the other sciences, the most that can be done toward establishing a *modus vivendi* is to show that there is "no conflict" between science and religion; for so long as the scientific treatment of religion goes on by a method entirely different from that employed by science in general, there can be no real correlation of religion and science.

The question whether there is a remedy for the isolation of theology and for the consequent tendency to schism in our higher life is therefore a question of whether this radical difference of method can be done away with. Is the dogmatic method necessary to theology? Could the empirical method be employed in its place?

The dogmatic method starts with the assumption of a certain infallible canon of truth. By the means of this canon our conceptions of truth in the realm to which it applies are to be investigated, corrected, and systematized, or our concrete experience is to be interpreted and completed, or rectified. All of our conceptions and experiences may be subject to scrutiny and criticism except the canon itself. That cannot be criticised. The canon may be a book, a creed, or some other form of tradition, an ecclesiastical fiat, or a set of intuitions: whatever it be, it is inviolable; it is the measure of all things, at least within a certain field, and therefore cannot itself be measured. The more extensive the canon the more dogmatic the science in which it is employed, for if the canon have a large content, the major truths of the science can be secured deductively from it. But if any portion of the truth promulgated by a science is shut up from investigation

because canonical, then that science is so far forth dogmatic.

What in the nature of theology has led to the universal adoption of the dogmatic method? Two reasons lie close at hand. The immediate practical interests of theology require it to have definite canons or norms. A science that is to serve life in its every-day and fundamental functions cannot be constantly going back to the beginning and scrutinizing its standards. It is, for instance, very difficult practically to change from the conventionalized natural systems of measurement to the thoroughly artificial metric system. Arithmetic must subordinate the consideration of whether a system of notation on the scale of eight or twelve would be better than one on the scale of ten, and must concern itself chiefly with the study of problems and methods on our present basis. The very inspiration to theology is the consciousness of possessing a sure body of truth, which it is desirable to hold in a scientific form because that form renders the truth more usable. When therefore an effective canon has been discovered, it is of the highest moment that it should be employed, not forever skeptically scrutinized. This being the natural status of theology, it has been psychologically easy to pass to the limit and pronounce the canon inscrutable; whereupon the whole body of teaching in any system of theology is transformed from normal or evaluated truth into dogma. This procedure has always characterized theology; even speculative theology has been no exception to the rule, for it has merely substituted one or more philosophemes for a more external or empirical standard.

But the full explanation of the domination of theology by the dogmatic method is not furnished by its important practical interests. Ethics has a similar practical

function, and yet it is showing itself far more amenable to the spirit of empiricism, — the attitude of mind which seems most favorable for the correlation of the sciences.

The second reason for the dogmatism of theology is that it steadily claims to deal with the realm of the supernatural; and while much in this realm has been conceived on the basis of human experience, its supernaturalness has been supposed to consist in just the respects in which it has been believed to be trans-experiential. The agnosticism that such a view suggests to the scientific mind has never occurred to theology, the traditional form of which has employed the conception of revelation to mediate to it the supernatural or trans-experiential. Here is where the dogmatic method has been absolutely indispensable. Since the supernatural is trans-experiential, it can only be known by means of some canon. This canon cannot be tested in turn by experience, because that would degrade the supernatural; it cannot be tested by the content of the revelation, because that is known to be supernatural by means of the canon; it must therefore be a dogmatically valid canon, inscrutable in its nature. This procedure of traditional theology has been abundantly criticised by the speculative form of theology, but quite inconsistently, for the latter has conceived the supernatural in the same way, and has only replaced a dogmatically canonized Revelation by a dogmatically canonized Reason.

Evidently if theology maintains the foregoing conception of its subject matter, it is irrevocably committed to the dogmatic method, and its present isolation among the sciences is irremediable. A change in the scientific status of theology is possible only on the basis of a different conception of the supernatural. Now if theology proper will turn to the historical branch of divinity, it will find

such a different conception already worked out upon historical principles. Historical theology's most important results may be summed up in the proposition that for the great personalities of the Hebrew religion, and for the founder of Christianity and his foremost interpreters, the supernatural is the ethical. Prophetic teaching, culminating in the Jewish exile, centred in the faith that God's nature is righteous and his power supreme. Jesus, reacting against contemporary legalism and particularism, teaches this faith of the prophets with new depth and universality. What is vastly more, he draws its practical consequences unhesitatingly, embodying them unswervingly in both his inner and his outer life. Paul lifts the conception of the Spirit, under which he freely subsumes the realities of his Christian experience, out of the sea of physical mysticism into the ethical realm. The most comprehensive thoughts and the most dynamic lives of Hebrew and Christian religion have this common significance, that they make for the ethicizing of the conception of the supernatural.

The systematic branch of theology needs to do nothing so much as to appropriate unreservedly the view of the supernatural that historical theology has laid at its threshold. It has of course been impossible for it not to make much of this essential feature of Christianity, and yet it has never taken it in its radical meaning. Theology has, to be sure, conceived of the Christian life ethically, but it has always assumed that this life was preceded by a supernatural salvation, meaning thereby an event really non-ethical in character. Its conception of God, too, while including all moral qualities, has made the essentially deifying qualities to be of a trans-experiential order. But if the supernatural in the universe is the ethical, then its nature and activities can no longer be regarded as trans-

experiential in just its most characteristic attributes. It belongs to the empirical order of being and therefore is not excluded by its very nature from being progressively apprehensible by empirical methods.

But while, if theology should adopt a thoroughly ethical conception of the supernatural, the dogmatic method would become unnecessary, the question remains whether the empirical method, as science has developed it, is adequate for dealing with religious experience.

If the past attempts of empiricism to treat of religion be consulted, the insufficiency of its method becomes plain. Empiricism has never been able to deal with the problem of the truth of religion. Either it has recognized this fact, and so has sought to deal with religion historically, on the supposition that it could do so without raising the question of truth, or it has concluded that no positive truth could be derived from religion. But these results must lead the religious man to view the application of the empirical method to his experience either with suspicion or with hostility, and consequently to take refuge in dogmatic theology. This failure of empiricism may be in part due to the fact that, misled by the official interpretations of theology, it has not grasped the ethical character which, in the more developed forms of religion at least, has been intrinsic in religion ; but it is more largely to be attributed to the inadequacy of its method.

In the empirical method[1] zest for analysis has been the ruling passion from which its notions of truth have been derived. The explanation of a thing, the truth about a thing, has for this method been found to consist in an enumeration of the component parts into which that thing could be resolved. So all-absorbing has been this passion

[1] Cf. Dewey's criticism of empiricism as applied to morality, *Philosophical Review*, vol. xi, No. 4.

for analysis, and so satisfying its results, for certain purposes of control or prediction, as to lead its devotees to regard these results as ultimates, — that is, to adopt them, not only as the final truth, but also as the real reality. It is true that a spirit of caution has frequently prevented such a point of view from being explicitly affirmed, but even then ultimate components have been the limiting conceptions from mere approximation to which a superior reality and truth could be claimed for any particular results of the analytic process. Thus empiricism has unwittingly become infected with an absolutist spirit. It has become guilty of two of the errors of absolutism: first, the error of regarding truth as the function of a single psychic process, in this case a peculiarly restricted one, — that of intellectual analysis; second, the error of assuming the identity of reality and truth, which, since empiricism may feel compelled to stop short of ultimate components, may take the form of regarding the truth of an idea as being measured by the degree of faithfulness with which it copies reality.

Whatever might be said about a method of the foregoing character when applied to the objects of physical science, it is palpably unadapted to dealing with religion. Religion is an evolving thing; its ideas and experiences do not exist in isolation but as parts of a process. Moreover these ideas are not inert members or by-products of the process in which they occur, but they are rather its active constituents, reacting upon it and transforming it into something different from what it would have been had they not entered into it. The meaning of religious ideas and experiences, therefore, must depend upon their context; they cannot be interpreted apart from what they do, and hence must be studied historically. But the empirical method, as science has developed it, is in spirit un-

historical, in spite of the would-be historical investigation of religion which it has sometimes undertaken. Empiricism, as has just been pointed out, seeks for the component elements of a phenomenon in the faith that such elements, if they can be found, are the ultimate reality. The phenomenon itself is first isolated and then its elements are sought as an interpretation of the phenomenon, which means that the elements, just as elements, taken in their isolation, are accorded final value. But such a procedure in effect denies the reality of any evolutionary process as such, and when applied to religious experience tends to paralyze rather than to sustain it. It separates religious states from all time reference, ignores their functional significance as a measure of truth, and estimates them solely by their relation to psychic elements. The consequence is that under the empiricist's touch, all objective value vanishes from religious experience. The ultimate psychic elements being for the empiricist as a matter of fact sensational, ideas have truth only as they copy or represent sensations; and since religious ideas can be so interpreted only very indirectly, the empiricist's treatment renders them exclusively subjective. Animistic religion may thus be completely disposed of as a confused understanding of the biological phenomena occurring in savage experience, and accordingly as something which has served no purpose, but is to be regarded, rather, as a fungoid growth on human life. And monotheism can at best be no more than morality touched with emotion, morality itself being man's necessary pursuit of pleasure or avoidance of pain, and the emotion, it may be, simply a perverted sexual instinct.

It would seem, then, that the real ground for the separation between theology and the empirical sciences is not simply the obstinate dogmatism of theology, but a positive

repugnance between two dogmatisms. The empirical method has developed within itself an absolutist spirit, logically quite inconsistent with its nature, though psychologically entirely explicable through the completeness of its temporary success in solving existing deadlocks in knowledge. But when the religious man has sensed more or less clearly the fact that the relation between empiricism and dogmatic theology contains an antithesis between two canons of truth, each really as absolute and inviolable to criticism as the other, it is easy to see which he will prefer. It is little wonder that he should submit his experience to be interpreted by the point of view which finds its norm in a rational faculty, or even in historic tradition, rather than by a method which estimates it on the basis of the dogma that correspondence to the sensational components of psychic experience is the ultimate test of truth.

A fundamental dualism, therefore, remains as a constant irritant in the minds of all those who seek to reflect scientifically upon religious experience and at the same time to assimilate the logic of empirical natural science, — a dualism that can be remedied only by such a reform of the methods in each field as will bring theology out of its isolation into the pale of the sciences in general. Now such reforms have already begun. On the side of philosophy the pragmatic form of empiricism offers itself, and this is met on the side of theology by the increasing sway of historical methods.

Pragmatic empiricism presents an empirical definition of rationality itself. Starting from the evolutionary view that man is what he is as the result of successful reactions upon environment, it seeks to interpret rationality on the basis of man's active nature. That is rational, it says, which leads to the smooth functioning of experience by

releasing tensions which have arisen, or which fosters a wider functioning than has been realized before. It recognizes as truth in the old empiricism the fact that the discovery of relatively permanent elements in experience renders it more rational by making customary, habitual functions possible, where the apparent complexity of experience tended to produce a condition of static strain. At the same time it points out that new tensions are at once developed if these permanent elements, instead of being recognized as practically useful only, are regarded as ultimates; in other words, as the realities of which all cognitive states should be copies. This is simply because experience has, as a matter of fact, a spontaneous character, which cannot be interpreted on the basis that custom is the sole criterion of rationality. In experience the new is constantly coming to pass along with the recurrence of the old. The cognitive function itself is an active one, which introduces modifications into experience. Hence pragmatic empiricism recognizes emotional interests and active faith as factors in determining the rationality of experience which have as good rights as has custom. It admits the syntheses of experience made from the standpoint of values and those effected through voluntary reaction upon the world as being just as capable of validation as the syntheses accomplished by the method of identifying elements.[1]

As has already been implied, pragmatic empiricism also presents an empirical definition of reality. Reality is pure or immediate experience itself. It is simply the flux of things and events characterized by presentness. Some of these things and events, it is true, may become cognitive; that is, they may represent other things, but these other things are pure experience to come or pure experience in

[1] W. James, *The Will to Believe*, p. 85.

the past. In other words, these cognitive experiences do not reveal or imply a trans-experiential reality, whether in the form of atoms as ultimate beings or in the form of unknowable things-in-themselves, nor do they give evidence of a trans-experiential soul substance; their cognitive quality, on the contrary, is simply a function of pure experience. The function that they fulfill as cognitive experiences is an instrumental one; it is to aid our voluntary nature in realizing values that it has set for itself. The cognitive states represent things, not in the sense of giving us a reality not otherwise possessed, but in the sense of truly or serviceably anticipating pure experience. Reality is a given thing; what cognition yields is truth or values. Reality is also a growing thing, — perhaps growing in all its parts, at least growing at the points where values are posited, where the teleological instruments known as concepts are generated, and where the reactions made possible by concepts effect the realization of values in the unchallenged fullness of pure experience.

The pragmatic form of empiricism, therefore, can do what the old empiricism could not, namely, recognize the ethical life as an integral and constitutive part of reality. Hence it puts empiricism for the first time in a position to entertain religious hypotheses in regard to the ethical character of the universe. And furthermore it is able to regard the specifically religious needs and reactions as means of attaining rationality that are as rightful as are those which are more definitely of the intellectual sort. Thus at length empiricism takes on a form that does not in principle rule out the question of the truth of religion.

Immanent within theology itself is a movement that comes to meet the pragmatic developments of science in general. It is to be found in the extension of the historical method. The professor of Old Testament exegesis has

become the historian of Hebrew religion, and the professors of New Testament exegesis and church history have become likewise historians of different periods in the development of Christianity.[1] The result of this change is an even closer approximation to pragmatic empiricism than is to be found in the historical movement at large, for the historian of religion is less likely than others to assume that his work must be "merely" historical, and must be kept apart from all questions of value.[2] He is as apt to insist over against the cause-and-effect historians that he is an interpreter of the meaning of events and not a mere chronicler, as he is to claim over against ecclesiastical dogmatics that those meanings must be found in the relation of events to their contexts, rather than by means of an *a priori* scheme involving a violation of such relations.

To sum up the foregoing: one root of the dogmatic method has been pointed out to be the belief that the supernatural, or divine, belongs to a trans-experiential form of being which requires an infallible canon as a means of interpreting its revelations. The history of Jewish and Christian religion, however, presents as the resultant of religious evolution the belief that the ethical is the essence of the supernatural. If theology accepts this principle, the truth that it seeks is of an empirical sort, and the chief reason for the dogmatic method is removed. But now pragmatism is transforming empiricism into a method that can deal with ethical experience and that can interpret the religious search for an ethical universe. And further, historical theology, whose results if appropriated would emancipate theology from the dogmatic method, is already implicitly pragmatic. It would seem therefore as

[1] A. Jülicher, *Moderne Meinungsverschiedenheiten über Methode, Aufgabe, und Ziele der Kirchengeschichte*, p. 23.

[2] *Ibid.* p. 13.

though the pragmatic conception of science opened the way for theology into the fellowship of the empirical sciences.

But the other source of the dogmatic method in theology remains to be considered. Theology exists for the sake of religion. Its work must be carried on with a view to the momentous practical interests that religion involves. Now these interests, as was pointed out at the outset, may be regarded as furnishing a pragmatic reason for not dealing with religion in the empirical way.

The various practical positions that theology, so far as it is prosecuted in Christian circles, is held to be bound to sustain have been concentrated in recent theological discussion into one, that of the absoluteness of Christianity. This conception is one that has been formulated with conscious reference to the evolutionary and historical viewpoint. It is, however, no merely controversial notion, for it has its basis in the nature of Christianity itself, as in the nature of all religion that can be classed with Christianity as redemptive and missionary. The vitality and the social effectiveness of religion depend upon the consciousness of possessing truth, — such truth as is adequate for the solution of the most momentous problems of life. Now a living conviction of the adequateness of Christianity is a constituent in the religious consciousness of many at least of its adherents; and on account of the practical efficiency of this conviction, both those who possess it fully and those with whom it is only partially present require a philosophy of the Christian religion to justify it and expect a system of Christian truth to presuppose it.

But it is generally supposed that in the nature of the case no empirical method can establish the absoluteness of Christianity or any other form of religion. If this be true, it would seem that the theologians are reduced to

the dilemma either of failing to interpret a most valuable feature of religious experience, or of reverting to the dogmatic method with its inviolable norms. The latter alternative appears indeed to be begging the question, for the absoluteness of the religion defended would be largely contained in the inscrutable canon, but the former is also deplorable.

But the pragmatic empiricist does not drop the word absoluteness from his vocabulary. In regard to the postulate of empiricism Dewey writes: "The real significance of the principle is that of a method of philosophical analysis, — a method identical in kind (but different in problem and hence in operation) with that of the scientist. If you wish to find out what subjective, objective, physical, mental, cosmic, psychic, cause, substance, purpose, activity, evil, being, quantity — any philosophic term, in short — means, go to experience and see what it is experienced *as*."[1] It is possible, accordingly, to give an empirical meaning to the conception of absoluteness. Now from the pragmatic point of view any value is such because it satisfies a need. But the satisfaction of a need that leaves no element of want still pressing for fulfillment has the quality of absoluteness. The reason why the pragmatist takes pure experience as his ultimate is that as an immediate process it sets no questions with regard to itself, but is characterized by sufficiency. He recognizes, however, that experience as a functioning, growing thing may develop within itself tensions, unsatisfied wants, questions; and so it comes to pass that a truth or an attitude in life which completely releases the active functions and gives the rein to practical life again has absolute value. Absoluteness, then, when applied to a value, must in the very nature of the case be regarded as

[1] *Journal of Philosophy, Psychology, and Scientific Methods*, ii, 399.

relative to the problem to be solved. If the problem recurs in generically the same way, it may be met again by the same type of solution, and the solvent truth may come to be labeled by the intellect as absolute truth. Any idea, therefore, that leads to the attainment of its goal has absoluteness as its characteristic.

But what is of absolute worth from the standpoint of a single desire will not necessarily be so when viewed from the standpoint of life as a whole. The establishment of absolute value for any solution of life's fundamental problem presupposes a systematization of values, and this in turn presupposes the guidance of a standard value. Yet even the selection of the standard value must be pragmatically grounded. This is the crucial point, if the system based thereon is to have a scientific character. The standard value secures its pragmatic footing by being adopted as the inwardly experienced solution of the thinker's own most vital problem. Thus it first wins objectivity. But this personally objective value is still subjective in the eyes of one's fellows, until through sympathetic appreciation of the issues that they confront, one has reflectively developed the problem arising concretely in one's individual life and has shown that its solution is adequate to the problem as thus enlarged. Here, however, arises a difficulty. Each individual's problem in its concrete form has characteristics that reappear perhaps in that of no other individual. How then can it be shown that a certain value adopted by the individual has general objective validity?

The appeal of the pragmatist is to history. The historical unfolding of values furnishes what is needed, — a means of determining their real significance by a study of the conditions that produced them. Professor Dewey has shown that history renders the same service here that

experiment does in physical science. "History offers us the only available substitute for the isolation and for the cumulative recombination of experiment. The early periods present us in their relative crudeness and simplicity with a substitute for the artificial operation of an experiment; following the phenomenon into the more complicated and refined form which it later assumes, is a substitute for the synthesis of the experiment.[1] That is to say, by the historical method, the individual's problem may be universalized, and the values of history may be presented as claiming objective validity for him.

It is therefore conceivable that an actual absoluteness should be scientifically established for Christianity, considered as truth or value, by a psychological and historical grounding of the standard value it presents, and by harmoniously subordinating to this standard, not only the other values of the Christian religion, but also the standard values of other religions. But a demonstration of absoluteness that seeks to anticipate this pragmatic argument, and by the aid of some metaphysical necessity to make it needless, can have no scientific value, because its presuppositions would inevitably be dogmatic. On the other hand, so long as the Christian theologian is unable to subordinate the norm of other religions to that of his own, and even so long as the upholders of other religions cannot find in the Christian religion a common norm, the absoluteness of Christianity will lack complete verification. "History is the great voting place for standards of value,"[2] and if a sufficiently thorough comparative investigation of the great religions should reveal a complete irreconcilability between their norms, the science that seeks to establish the absoluteness of one of them must realize

[1] *Philosophical Review*, xi, 1902, pp. 107–124.
[2] H. Höffding, *Problems of Philosophy*, p. 168.

that the complete attainment of its end depends upon the outcome of their conflict, and that in the mean time its function is to develop as clearly as possible the issue involved.

It must further be recognized that even though a subordination of all existing values to one religious standard value may be hoped for, the result of the achievement will consist in establishing for the religion furnishing and conforming to that standard not a final but an actual absoluteness. "All worth rests on the relation of events and of conditions to life at its different stages, to the existence and evolution of life." [1] The theoretical possibility remains that in a world of growing reality new values may arise, and that these may modify the old values, or be quite discontinuous with them. Here again it holds true that a demonstration of absoluteness which of necessity should exclude such a theoretical possibility would be an artificial thing and would vitiate, by the dogmatic assumptions that it would be compelled to make, the scientific character of the actual absoluteness that might otherwise be shown.

Meanwhile the actual absoluteness of Christianity, so far as it can be grounded in religious psychology and religious history, is undiminished by discrediting any artificial supplement that might be constructed through the aid of some supposed metaphysical necessity. The recognition of the mere possibility that new values may arise, which may even be discontinuous with the old, does not mean the recognition that there have already arisen needs calling for such values; it merely asserts the sovereignty of this additional practical need that, when new needs do arise, they should be satisfied by their appropriate values. It is true that the maintenance of a right proportion in

[1] H. Höffding, *Problems of Philosophy*, p. 154.

values may require the subordination of the new needs, but at all events they must not be suppressed in advance by *a priori* reasoning. This priority of needs to values is already an element in the standard value of Christianity. No other religion so completely enthrones faith, — the quintessence of the soul's spontaneous power, the function on which the positing and realizing of values is conditioned. Hence the self-same pragmatic reasoning that for the sake of efficiency in the religious function calls for the justification of the absoluteness of our religion requires also that this absoluteness shall take on no form that will suppress spontaneous faith.[1] Actual absoluteness sustains faith, dogmatic absoluteness stifles it. The pragmatic treatment of religion opens the way for continuing the naïve sufficiency of spontaneous religious experience upon the new basis of a reflectively developed conception of religion; while the dogmatic treatment, by offering a substitute for this naïve consciousness, impairs the most vital element of religion and so tends to vitiate the function of theology.[2]

It would have been impossible in the compass of this article to map out, even in diagram, a philosophy of religion in which the norms of religious truth should be historically grounded or to give a detailed method for constructing a theology by the use of such norms. The present purpose has been realized if a way has been shown for theologians to square their points of compass with all science that is willing to be pragmatic, and so for philosopher and theologian each to recognize the rightfulness of the other's province, and at the same time to coöperate in attaining a unified view of the world.

[1] Cf. W. James, *op. cit.* pp. 82, 90.

[2] Cf. the implicitly pragmatic views of Troeltsch, *Die Absolutheit des Christentums und die Religionsgeschichte.*

STUDIES IN PSYCHOLOGY

IX

INFLUENCE OF SURROUNDING OBJECTS ON THE APPARENT DIRECTION OF A LINE

Edmund B. Delabarre

The fact that, in looking at objects about us, we recognize at once with a high degree of accuracy the relative directions of the lines limiting and crossing their surfaces, seems to most persons to need no explanation. When I have said to friends who have no very profound knowledge of psychology that I was trying to determine what it is that makes us see the lines of objects as inclined in a particular direction, they have not infrequently replied, "Why, of course we do; we see them so because they are so." This is the natural feeling: there is no problem there; we are pretty sensible creatures on the whole, and if we have eyes to see with, of course we can see things as they really are. Still, there is no psychologist who accepts the matter quite so simply. Things are one fact, and are outside us; our consciousness is another, apart from them. Even to such idealists as believe there is really nothing other-than-ourselves, this statement represents a scientifically expressed truth, and the relation of knowing which exists between what we call objects and what we call self is one demanding explanation. The things do not in any way leave their position outside and actually enter into consciousness, nor does the latter spread out and enfold them. Rather, the things act physically, either directly or through intermediate physical

forces, on sense-organs, and these on nerves, and these in turn on brain-cells. Our consciousness, our "seeing something," is not connected directly with the things outside, nor with the sense-organ's activity, nor with the nerve-processes, but only with what is happening in the brain. How can a brain activity — which does not resemble the external thing in the remotest degree — determine a visual awareness of what the thing is like? There is the real problem. It clearly needs to be explained how, at the end of such long and complicated series of intermediate happenings, our conscious seeing is made what it is, whether or not it actually does correctly represent the outside things that we think of as causing it.

Many theories have been suggested in answer to this problem. It has been held that the objects give off emanations, tenuous duplicates of themselves, that have the power to penetrate through sense-organ and brain into the mind. Or again, that the mind looks out clearly through the eyes as windows, and so sees things as they are. These are early childish speculations of immature thought, ignorant of the actual complexity of the facts. Psychologists give adherence for the most part to one or the other of two views, each of which, however, exists in numerous varieties. To the nativists it seems probable that sensations aroused through stimulation from objects can account for only a part of what we see, and that the spatial and some other characteristics of objects, in whole or in part, are supplied by the mind itself, are added by it to the incoming sensations. Whence the mind derives its power to know these verities outside it, may be accounted for in various ways. It may be that it possesses innate ideas of them, into which it can incorporate the sensations; or that it inherits a "form" or tendency to arrange its sensations in just that truthful way; or that it has a higher

organ than those of sense for knowing the truth of things outside. All this is essentially an indeterministic, interactionist attitude. It gives little in the way of real explanation, and none that can be made applicable to the intricate details of the case. To one whose faith in the universality of natural law inclines him toward the deterministic, parallelistic interpretation of mental and physical phenomena and their mutual relation, the empiricist-genetic view appeals. I may as well frankly state at the outset that, on all possible grounds, — scientific, metaphysical, ethical, or æsthetic, — this is the only view that seems to me at all adequate to deal successfully with the facts. According to it, the mind possesses no power or faculty or nature of its own that can add anything to sensory experience; for it is itself, so far as we can empirically know it, nothing but the sensations, and the combinations and successions that they form. The things it sees are built up within it by the slow process of sense experience, just as it itself is a larger sum total of individual experiences; and the ways in which it sees things are all due to the sensations that arise within it, and to the manner in which their constantly repeated associations with one another furnish a basis for their interpretation.

The seeing of things is not an innate faculty, nor do the eyes serve in any real sense as the "windows of the soul." We have to learn to see. The eyes themselves, through their retinal activities, give us only sensations of color. These, alone by themselves, would always remain a meaningless chaos of vague feeling, unapplied to the objects about us. It is through the *movements* of the eyes that the colors are distinguished, that the chaos is separated into parts, and the parts given a definite and orderly arrangement; and the sensations arising from eye movements and eye adjustments come to stand for

exact dimensions and forms of objects about us only through the fact of their close association with the more stable and unambiguous movements of hand and of locomotion which we make in handling the objects looked at.

The object as we see it is a mental fact, not an external fact. It is a visual perception-of-something. What the object as an external fact is like we cannot know directly, but guess at more or less successfully in scientific and philosophical speculation. For practical purposes we do not need to know or care. It is sufficient for us that we treat the perception as if it were itself the external object, and that this procedure serves as a reliable basis for our actions.

Each such perception is an enormously complex structure, a mass of closely interwoven present and past sensations. Into its composition enter the actually present sensations of color and of eye movement and adjustment, "apperceived" or interpreted and given body and meaning by the re-arousal of numberless previous sensations of color and of movement which the rich variety of our past experience has definitely associated with each possible present combination of them. Any object, if it is to be clearly seen, necessitates an eye adjustment of a definite nature. The sensations derived from these motor activities recall and imply other definite motor experiences of eye, of hand, and of body. Each such motor complex of present and revived sensations furnishes the spatial feel, into which the colors are filled; and thus the thing as seen constructs itself for consciousness.

It follows that every detail of our perception of the spatial characteristics of objects must be dependent on some particular form of movement adjustment. We distinguish differences in length, size, shape, distance, direction, posi-

tion, just in so far as we can distinguish the particular movements and adjustments adapted to them.[1] This we can assert with much confidence. For though there are those who still believe that these things are to be explained by some inborn capacity of the mind, or that they reside implicitly in the color sensations themselves, yet the evidence for this, the empirical and genetic view, is constantly becoming clearer, and is probably accepted as convincing by most observers. But the growth of each one of these details of space perception is intricate and difficult to trace fully, so that each furnishes a problem whose solution can be found only by long continued and varied experimental research.

Eight years ago I began to study the accuracy with which we can perceive the verticality of a line, as one of the relatively simple features of the general problem of the nature and genesis of space perception. It has proved to be far from a simple problem, however, inasmuch as the factors which influence the appearance are very numerous and complexly intermingled. I have made about 10,000 single observations myself, and recorded more than 6000 by other observers, under varying conditions, and feel that I am yet far from having solved all the intricacies of the problem. Some of the results of this investigation I have already published.[2] In this paper I propose to set forth in greater detail, and in the light of later tests, the results obtained in one fragmentary part of the whole investigation. I shall try to show what is

[1] This does not imply or necessitate that we should be able to discriminate delicately between different eye movements and positions themselves, when they are isolated. Our ability to do that is very limited. It is only when they combine with color sensations and revived material into definite perceptions of external objects that they attain any significance or delicately distinguishable difference.

[2] *Journal of Philosophy, Psychology, and Scientific Methods*, 1904, i, 85-94.

the influence exerted on the perception of vertical and of horizontal directions, and thus on the apparent direction of lines in general, by the presence of other visible objects besides the line in question.

When I first approached the problem, my reflections were somewhat as follows: Among the possible directions of lines, the vertical is one of which we have a fairly definite idea, and it ought, therefore, to be easy to determine how accurate that idea is, and the influences affecting our judgment of it. Among the influences established by earlier observers is that of indirect vision: if one fixates a point situated off to one side, of a line, the line appears curved concavely toward the fixation-point. Now it is well known that there is a strong tendency to turn the eye toward any point that attracts attention. If therefore the line itself is fixated and bright spots are introduced into the field to one side, they will tend to attract the eye away from the line, and will therefore very likely produce an effect of the same nature as that due to deliberate fixation to one side. Even if the eye does not turn, a muscular tension toward the disturbing spot will nevertheless exist, and this may give rise to a similar effect. On testing these conditions, I found indeed some effect, but it was very slight and uncertain, and so far as it went seemed to be of a nature opposite to that which I had anticipated. Later I discovered unexpectedly that objects to which I had been paying no attention at all, on account of their remoteness from the line, were influencing the direction in which it was placed. Here also the influence was slight, and opposite in its nature to that of fixation to the side. Accordingly, since my earlier paper was published, I have made a more careful investigation of this matter, and have obtained results showing a much larger and more certain influence, and

confirming largely, but also greatly adding to, the indications of the earlier trials.

The method of experimentation in all these tests is simple. Sometimes I have used a white thread placed in front of a dark background, with its bottom end fixed and its upper end movable to right and left by means of cords in the hands of the observer. Or the thread has run from centre to edge of a large black disk which can be moved as a whole about its centre. Sometimes the thread has been black and its background gray. In many cases also a translucent line, made luminous by a light behind it, has been observed, within a field that is otherwise entirely dark. In any case, the observer is required to move the thread or line until it appears to him to occupy a vertical (or horizontal) position, and then its actual position, in degrees of deviation from the vertical (or horizontal) is recorded. A series is always taken with all variable conditions excluded, so far as they can be controlled; and then the special conditions under investigation are introduced, and the results compared.

INTERPRETATION OF RECORDS AND OF ABBREVIATIONS USED IN THE TABLES

In the records of results it is always to be understood that the inclination of the line is indicated from the bottom upward for vertical lines, from left to right for horizontals. A typical record might read: (10) 0.12R $\pm$ .16. In this, the figure in parentheses will indicate the number of single observations from which the average is computed; 0.12R will mean that on the average, in these 10 tests, the line has appeared vertical when it was placed with an upward inclination of 0.12° toward the right; the following indication shows that the average variation was .16°. Following the average, L will indicate inclination

upwards to the left; D, inclination from left to right downward; and U, from left to right upward. If the line, when it appears to be vertical, is actually inclined to the right, it will, when it is really vertical, appear to be inclined by a similar amount to the left. But the record is always in terms of the position in which the line is placed when it appears to be vertical or horizontal.

In a comparison of results, + will indicate that a line is placed with its upper end farther to the right for verticals, or with its right end farther downward for horizontals, under the first named condition than under the second; and — will indicate the opposite.

Other abbreviations are to be understood as follows:—

A: Normal or standard tests, with the line itself directly fixated, either at the bottom (or at the left for horizontals) or with free movement of the eye along it; variable conditions excluded so far as possible.

RA, LA, BA: Normal tests with right eye alone, left eye alone, both eyes together, respectively.

OR, OL, OB: A field of distinguishable objects visible peripherally to the right of the line, to its left, or on both right and left sides, respectively. OU, OD: Similar fields situated upward or downward from a horizontal line.

RD, LD: Fixation with the right eye or left eye respectively on a point of the field situated off to the right of the bottom of the line. RG, LG: Similar fixation on a point to the left.

Extr.: Difference between extremes of position recorded in a series.

Obs.: Observer; each is designated by a separate number.

Influence positive: The line appears inclined (reading upward for verticals and rightward for horizontals) in a direction toward the side from which an influence is ex-

erted, or on which a side-fixation or effort is made, when it is really vertical or horizontal.

Influence negative: — The opposite of the above.

A. THE EARLIER SERIES OF TESTS

1. *Influence of single bright spots introduced into the field.* — Conditions: white line against a dark field, illuminated by incandescent lights; background perforated by small holes to right and left of bottom of line, situated from $\frac{1}{4}°$ to $1\frac{1}{2}°$ from it; any one of the holes can be opened alone and illuminated by a light behind it.

TABLE I. — SINGLE BRIGHT SPOTS INTRODUCED INTO THE PERIPHERAL FIELD, FEBRUARY 3 TO MAY 23, 1899.

Obs.	No. of Tests.	Influence Negative.		Influence Positive.		No Effect. %
		% of Cases.	Amount.	% of Cases.	Amount.	
1.	148	79	.22°	21	.26°	—
2.	158	81	.18	19	.23	—
7.	66	83	.19	17	.40	—
9.	10	100	.70	0	—	—
10.	71	50	.27	17	.42	34
Average:		79	.31	15	.33	7
Exceptional:						
8	63	25	.35	59	.28	16
11	57	42	.20	33	.29	25

The results appear in Table I. It shows that an actually vertical line appears inclined from one third to one fifth of a degree upward away from the disturbing spot, in a large majority of cases. The amount of influence is small, it is subject to many exceptions, and the number of tests made is far from sufficient to establish this result unequivocally. These tests taken by themselves would hardly warrant any definite conclusion. Grouped as above,

they indicate feebly a real tendency established by later tests. The reality of the tendency, in spite of much variability in results, is further indicated by a brief series of 24 tests, in which brightly shining spots produced a much larger influence (.52°) than faint ones (.17°). The results are too variable to permit a reliable estimate of the relative amount of effect produced by disturbing spots in the field to the right and by those to the left of the fixation-point, or by spots at different distances from it.

Two later attempts were made to determine more definitely the effect of these single bright spots, by means of a luminous line shining in an otherwise entirely dark field, into which the disturbing spots could be introduced. One hundred and ten tests were made in May, 1904; and 213 in February, 1906. It is impossible to make from them any reliable deductions as to the influence in question, mainly because under these conditions the results of the fixation of the line itself without disturbing conditions of any kind, so far as these are controllable, are exceedingly variable and irregular. The influence of the bright spots, if there is any, is evidently slight, is easily obscured by the larger influence of other effective variables which cannot be excluded, and may conceivably itself be variable: the spot may be excluded from attention and produce no effect; or it may thrust itself on attention, and then either exert its normal influence, or lead to an attempt to resist and correct that influence; and if this correction is over-large and undetected, it would then appear to indicate the existence of a tendency the opposite of that which really exists.

It is not surprising, then, that the results are variable and to some extent conflicting. I think, however, that we may conclude that a single disturbing spot introduced into the peripheral field tends to give a vertical line a slight apparent inclination with its upper end away from

the spot; but also that many attending circumstances may lead to a modification of this tendency. That these variations in effect actually exist is still further indicated by many introspective observations, of which I cite a number. Observer No. 6 at one time "feels that top of line is pulled toward the right by the bright spot on the left;" but again, "feels that the bright spot pulls the line toward it." Observer No. 2: "Regular curve bulging away from the bright spot frequently recorded by this observer, though a few cases where the curve is toward the light;" again, "movements of the line connected apparently with flashings of the light." Observer No. 1: "Tendency for bright spot to attract eye seems to grow larger with continued fixation, but may then be more fully allowed for and produce more variation;" "line is much more active and changeable when holes are open."

Another interesting fact that appears clearly in the tests with the luminous line is that after a series of measurements with disturbing spots on either side, the next normal measurements show a large apparent inclination toward the opposite side. This seems to indicate the existence of an after-effect of the same nature as the original influence, and of a much larger amount; which, it seems to me, in connection with later similar or alternating after-effects, is an indication of conditions of tension in the muscles of the eye.

2. *Influence of more remote ordinary objects.*—For a long time I worked with a line moving over a uniform gray or black background extending into the peripheral field to a distance of about 17° on either side. Beyond this background a dark brick wall was visible peripherally on one side, and on the other side was the open room with its many distinguishable objects. Usually cloth screens were placed on both sides, shutting out these ob-

jects. But during some trials without the screens I seemed to note that the results were influenced. Accordingly I made a series of tests (February 18 to March 6, 1902), in some of which the brick wall was on the right and the large field of peripherally visible objects on the left; and in some of which their position was reversed. With the open field to the left, the line was placed farther to the left: .16° for the right eye (122 tests), and .14° for the left eye (193 tests). With fixation on a point in the field off to the right of the line, the influence apparently still held, the top of the line being placed for the right eye .33° (24 tests), for the left eye .43° (29 tests), farther to the left when the open field was on the left. With side-fixation toward the left, no difference resulted in 42 tests. The influence here was apparently the same as that of the single bright spots: objects visible in the peripheral field cause the line to appear with its upper end inclined slightly away from them. Again, however, the influence is so small that it might indicate nothing more than the ordinary variability of the normal judgments of the line, except when taken in connection with the similar results of the other series of tests.

It is evident that, without using a luminous line in an entirely dark enclosure, no field can be arranged within which no differences can be distinguished. The trouble with the luminous line is that judgments with it are naturally so exceedingly variable that it is almost impossible to determine the influence of any special conditions. But if we use any other kind of line, however carefully we may try to make the background and side screens uniform, they will nevertheless present numberless little differences in texture and illumination, in distinguishable spots and lines, in light and shade. In actual use, with attention concentrated on the line itself, these ordinarily escape

notice; but they may suddenly flash into consciousness and prove a disturbing influence. I have a great many records in which this fact is noted by different observers, but in most cases they do not aid in determining the exact influence exerted. In case definite lines are visible peripherally, they may influence the apparent inclination of the main line by comparison of direction instead of in the manner already described for peripherally visible objects without definite lines. Thus in one case when, in order to exclude vertical lines bordering the field on either side, I had made the lines bordering the immediate field about the movable line incline upward and outward from the bottom point of the line, an observer noted a disturbing influence from these side lines. I therefore had him make three series of ten trials each: in one case allowing the left-hand oblique line to influence his judgment, with the result that the line was placed at .50° inclination to right, ± .42°; in one case neglecting both oblique lines, .70° left ± .15°; and finally with accompanying consciousness of the right-hand oblique line, 1.30° left ± .41°. The result here is opposed to the usual one with disturbing objects on right and left, but this is due probably to the fact that comparison is made with definite lines known to be oblique, and perhaps judged to be more oblique than they really are, which would cause the apparent vertical to be placed farther away from them. It is to be noted also that the variability of judgment is much greater when it is determined by such indirect comparison.

3. *Influence of predominant awareness of field to right or to left of line.* — It is impossible, when examining a line, to be unaware also of more or less of the field surrounding it; and it is not easy to so turn attention as to make this awareness cover equally the fields on both sides. Again, it is possible to assume a feeling, difficult to

describe, as if one were looking out through the right eye alone (and this whether right eye or left eye alone is actually used in fixation, or both eyes together), — a feeling which is accompanied usually by a greater awareness of the field to the left of the fixation-point, and which for brevity I call the "feeling of right-eye fixation," whichever eye is actually used; or to adopt on the other hand a feeling of "left-eye fixation," with accompanying awareness of the field to the right. These differences in feeling are probably dependent on muscular conditions; for as one changes from the one to the other there is a distinct feeling as if the eyes were moving, even though one feels at the same time that they are still accurately converged on the fixation-point. It is doubtful if a real movement of the eyes occurs, though certainly, if it does not, there is a change in their muscular tensions. That the latter is the true basis of the feeling is indicated by observations both by the "microscope method" and by the "after-image method," discussed later, which show that, whichever side of the field may be thus emphasized, either by the simpler direct awareness or with the complication of these eye-feelings, the direction of the eye may actually be toward either side of the line.

TABLE II.[1] — PREDOMINANT AWARENESS OF FIELD TO RIGHT OR TO LEFT RESPECTIVELY. FEBRUARY–APRIL, 1899; FEBRUARY–MAY, 1900.

Obs.	Awareness to L.	Awareness to R.
1	(16) + 0.50°	(20) + 0.15°
2	(10) + 0.60	(10) — 0.10

I have tried only a few experiments to determine the influence of this difference on the apparent inclination of the vertical. The results are given in Table II. This

[1] See list of abbreviations, p. 245.

would seem to indicate an influence the opposite of that already found for disturbing objects, namely in this case an apparent inclination of the vertical toward the side of which there is greater awareness. More recent observations confirm this conclusion, though with important modifications due to the portion of the line fixated, which will be discussed later, under B, § 6.

My notes show that it is very difficult to maintain accurately the desired type of fixation during actual examination of the line. This is usually more or less prolonged, and the fixation changes easily and unconsciously from one type to the other; "the particular attempted method of fixation cannot be maintained unchanging," and which prevails at the actual moment of decision as to the position of the line cannot be known. I give these results, however, few as they are, since they are in accord with my later analysis of the influences at work, and hence serve as a slight further support to its validity.

4. *Influence of number of distinguishable objects; influence of illumination.* — The general effect of a wide field of visible objects is to steady the eye and render its judgments more uniform and reliable. A single luminous line with nothing else visible is subject, as we shall see later, to the greatest degree of variability in the positions wherein it may appear vertical. Increase the general illumination, so that the surroundings of the line become visible, and the judgments become less variable, even though it may be only a fairly uniform field of cardboard, cloth, or blank wall that thus comes into view. Tables III and IV show this effect; the variability is less when a wider field or a larger number of surrounding objects becomes visible, even though these may furnish no direct basis for comparison.

This fact of the great steadying value of surrounding

TABLE III. — EFFECT OF INTRODUCING INTO THE FIELD A NUMBER OF DISTINGUISHABLE OBJECTS, — PAPER, THREAD, HANDKERCHIEF, ETC. FEBRUARY 15, 1902. OBSERVER NO. 1.

Normal		Steadying Objects	
RA	LA	RA	LA
(21) 0.10 R ± .18 (10) 0.27 L ± .16 (5) 0.08 L ± .23	(10) 0.12 R ± .25 (5) 0.22 R ± .23 (3) 0.60 R ± .11	(5) 0.52 R ± .05	(5) 0.20 R ± .15
Av. 0.03 L ± .18 Extr. 0.80	0.23 R ± .25 1.10	0.15	0.50
Difference in variability Difference in extremes		—0.13 —0.65	—0.10 —0.60

TABLE IV.[1] — COMPARISON OF RESULTS, IN ONE CASE EXAMINING THE LINE IN ORDINARY WAY, WITH A FAIRLY WIDE FIELD VISIBLE, CONSISTING OF SCREENS, OBJECTS BEYOND THEM PERIPHERALLY, ETC.; IN THE OTHER CASE LOOKING AT THE LINE THROUGH A TUBE, BLACKENED INSIDE, WHICH THOROUGHLY CUTS OFF THE VIEW OF EVERYTHING EXCEPT A CIRCULAR PORTION OF THE DARK FIELD AROUND THE LINE. IN FEBRUARY, WITHOUT THE TUBES, ILLUMINATION WAS FROM A WINDOW AT THE LEFT, THE FIELD ON THE RIGHT BEING SOMEWHAT BRIGHTER AND FULLER OF OBJECTS BEYOND THE SCREEN; IN MARCH THE FIELD WAS MORE OPEN ON THE LEFT. FEBRUARY AND MARCH, 1902. OBSERVER NO. 1.

Date	No Tubes.		Tubes.		Difference[2]	
	RA	LA	RA	LA	RA	LA
2/10	(5) 1.44R±.13	(5) 0.50R±.09	(5) 2.00R±.18	(5) 0.04R+.17	+0.56; +.05	—0.46; +.08
			(5) 1.50R±.19	(5) 0.26L±.16	+0.06; +.06	—0.76; +.07
2/11	(5) 0.80R±.05	(5) 0.92R±.07	(5) 2.10R±.13	(5) 0.36R±.20	+1.30; +.08	—0.56; +.13
	(5) 0.36L±.12	(5) 1.00L±.03	(5) 1.70R±.34	(5) 0.52L±.25		
	(5) 0.24R±.11	(5) 0.26R±.10			+1.46; +.23	—0.78; +.15
3/8			(15) 0.70R±.13	(21) 0.13R±.17		
			(5) 0.18R±.18	(2)[3] 1.15R±.05		
3/10	(5) 0.38R±.07	(2)[3] 0.00 ±.00				
3/11	(5) 0.08R±.07	(5) 0.14L±.06			+0.21; +.08	+0.27; +.11

[1] See list of abbreviations, p. 245.

[2] The first difference given in each case is that in position, the second that in variability, when tubes are used as compared with "no tubes."

[3] Omitted in calculating differences, because of small number.

TABLE V.[1] — COMPARISON OF RESULTS WITH DAYLIGHT ILLUMINATION, FALLING IN ONE CASE FROM A WINDOW BEHIND TO THE RIGHT, AND ILLUMINATING MORE FULLY THE LEFT PART OF THE FIELD, IN THE OTHER CASE FROM A WINDOW BEHIND TO THE LEFT, WITH RIGHT PART OF FIELD MORE FULLY ILLUMINATED. SEPTEMBER AND OCTOBER, 1901. OBSERVER NO. 1.

Condition.	RA	RD	RG	LA	LD	LG
Window on R.	(15) 0.20 R	(5) 0.12 R	(5) 0.70 R	(20) 0.55 L	(10) 1.10 L	(10) 0.15 R
Window on L.	(44) 0.68 R	(15) 0.07 R	(15) 1.20 R	(53) 0.33 R	(15) 0.71 L	(20) 0.42 R
Difference	+0.48	−0.05	+0.50	+0.88	+0.39	+0.27

objects is often clearly felt by the observer. "These values are much more uncertain and irregular than those of yesterday, probably owing to closing up of side of field and thus removing steadying objects;" "Daylight illumination is less fatiguing;" "These judgments made with clear skies are more accurate than those made when clouds hid the sun." Actual comparison of the results obtained on cloudy, medium, and bright days shows too large a variability to permit deductions, probably because complicating conditions were at work. But there is always a greater feeling of certainty and ease, greater rapidity, much less hesitation, vacillation, and dissatisfaction with the final position, in setting up the vertical when there are many objects about and the illumination is good. The later tests will give much stronger confirmation of this than can be found in these earlier ones.

The illumination has an effect also on the position in which the line is placed, — on its apparent inclination. If the source of illumination is such that the field to one side of the line is made more pronounced than that to the other side, that field will exert an influence on the perception of the line's direction, usually causing its upper

[1] See list of abbreviations, p. 245.

end to appear inclined more toward the opposite side. This effect is seen clearly in Table V, wherein it is also evident that the same influence holds when fixation is off to one side of the line as when the line itself is directly examined. In Table IV the nature of the influence is not so certain. In the February tests, when no tubes are used, a larger field of objects becomes visible on the right, and its normal influence on the line is seen in the results obtained with the right eye. But the effect with the left eye was uniformly opposite in direction. If to it also the right field was the more prominent and exerted its usual effect, the deviation in direction with and without the use of the tubes should, it would seem, be of the same nature as with the right eye. I assume, however, that, if these results are really due to this effect of the side field and not to other complicating conditions, the difference in the fields was not so great but that, with the left eye alone in use, the naturally greater extent of its field of view toward the left side more than counterbalanced the greater relative prominence of the field on the right. In the March tests, on the other hand, the field is more open to the left, and each eye shows a like result; but here the line is seen, when vertical, with its upper end apparently inclined more to the side of the open field, contrary to the usual result. This may be one of the untraceable effects of the great complication of conditions always present. How great and how untraceable this complexity is becomes evident in examining the results obtained by the normal examination of the line with no variable conditions present so far as they can be detected and controlled. On two days (February 10, 11) the average positions given to RA and to LA in different trials differ from one another by as much as 1.80° and 1.92° respectively, — a greater difference than that we are attempting to use as

indication of definite influences. What wonder, then, when so many influences are at work whose presence and nature cannot be detected, if a much smaller real influence becomes overwhelmed and disguised in the mass of total complex influences? Yet even here a plausible explanation can be found, tracing the effect to the influence of the visible peripheral fields. The left field is here more open, it is true; but the right field also offers distinguishable features, and our later results will show that the right field almost always exerts a much stronger relative influence than the left field. The more open left field here, then, was not sufficiently great in its relative prominence to overcome the less prominent but naturally stronger right field.

5. The number of experiments in these earlier series is much too small, the results gained from them are too little certain in their interpretation, to warrant any definite conclusions when taken by themselves. They are, however, suggestive, and together indicate a considerable probability of the truth of certain facts which are confirmed by the later tests. Such conclusions as are justified by both series together will be found concisely stated in the summary at the end of this paper.

B. THE LATER SERIES OF TESTS

Under all the conditions tested thus far the influences exerted, if any at all are really indicated, were very slight and uncertain. But in all these cases the distinguishable features were either few in number (single bright spots), or slight in intensity, interest, and individuality (the unavoidable spots and differences in texture and in light and shade on a background intended to be uniform), or remote in position. It therefore seemed desirable to establish conditions under which these features could be

greatly strengthened. Accordingly I prepared a disk of black cardboard, 230 mm. in diameter, revolving about the centre, with a white thread extending from the centre upward to the edge. A rectangular opening, about 12×100 mm., was cut in a page of newspaper, and on the paper, to right and left of the opening, were pasted irregularly a large number of red, green, and blue wafers of many shapes and sizes: circles, diamonds, stars, spades, clubs, etc. This was then fastened over the disk in such a manner that the white thread ran longitudinally through the opening and had on each side of it, therefore, first a narrow black field and then a wide field containing a multitude of distinguishable objects. Two curtains of black cloth were secured to the disk. When both were lowered, the field about the white line was entirely black. When either one alone was raised, or both together, the corresponding fields on either or both sides became visible, with their numerous striking contents approaching to within a short distance from the line. The eye of the observer was 950 mm. distant from the field under observation, and a head-rest was used to make the position uniform. The disk was set at the end of a large rectangular box, inclosed on all sides by black cloth. The head of the observer was covered by a large cloth shutting out all light except enough entering above from behind to make the field well visible. The scale of degrees by means of which the angular deviation of the line from verticality was measured was too remote vertically to be visible when the centre of rotation was fixated; moreover it was made almost entirely invisible unless illuminated during the readings by an incandescent light from behind; and the results, as well as the statements of the observers, show that its presence did not affect the position in which the line was placed.

It need hardly be said that the observers were not informed as to the purpose of the tests, or as to any probable result. So far as my own results are concerned, though I usually recorded my own results and was thus aware of them as they occurred, yet it is clear that neither preformed theory nor actual knowledge of results influenced the positions which I considered vertical under the different conditions; for (1) my results did not differ materially from those of other observers; (2) nor from my own when I had the positions recorded by some one else, without knowledge of results on my own part; and (3) the actual results were really opposed to what I should have anticipated at that time, namely, that a field of distinguishable objects to one side would attract the eye unconsciously toward itself and thus produce the effect of side-fixation to that side.

The results are too numerous to be given in detail, and we must be contented with averages. These averages are usually derived from thirty measurements made under each condition for each individual, — ten with the right eye, ten with the left eye, and ten with both together; though in some cases they represent a much larger number, and in a very few cases less. The tests were all made in January and February, 1904. Results with right eye, left eye, and both eyes are averaged together, because the differences between them are not of sufficient importance for special notice, and to have separated them would have shown no essential difference in the typical result. Tables VI and VII present the details as thus worked out. Averages showing an influence of less than 0.50° are considered as indicating "no effect," and all exceptions to the typical result fall among these.

1. *Influence on apparent direction of line.* — The typical result is announced in Table VII. With the right

field open, the line appears inclined more to the left, averaging in amount 0.91° ±.26. With the left field open, the line appears inclined more to the right, averaging in amount 0.50° ±.26. The difference between the two fields averages an apparent inclination of 1.40° ±.36 farther to the right for the left field. Only four individuals out of the seventeen show any trace of an exception to this result, and for them the influence is very slight or wanting altogether.

TABLE VI.[1] — AVERAGE INFLUENCES OF PERIPHERAL FIELD OF DISTINGUISHABLE OBJECTS. JANUARY AND FEBRUARY, 1904.

Obs.	OR		OB		OL		A	OL
	Av.	Av. Var.	Av.	Av. Var.	Av.	Av. Var.	Av. Var.	compared with OR
1	+0.89[2]	±.18	+0.57	±.20	—0.38	±.21	±.21	—1.31
18	+0.78	.25	—0.32	.16	—0.33	.21	.29	—1.09
19	+0.62	.32	—	—	—0.80	.26	.30	—1.42
21	+1.32	.25	0.00	.12	—0.85	.36	.25	—2.17
23	+0.70	.27	0.00	.30	—0.46	.28	.24	—1.15
25	+0.87	.30	+0.35	.35	—0.07	.39	.35	—0.94
27	+0.86	.26	+0.17	.14	—0.13	.56	.39	—0.99
28	+0.73	.30	+0.68	.06	—0.52	.34	.38	—1.26
29	+1.20	.56	+0.64	.29	—0.34	.57	.47	—1.11
30	+0.32	.41	—0.56	.34	—1.35	.26	.22	—1.67
31	+1.77	.48	+0.63	.33	—0.53	.41	.37	—2.30
32	+1.09	.24	+0.30	.20	—0.64	.34	.30	—1.73
33	+0.73	.30	+0.75	.30	—0.14	.39	.38	—0.87
Av.	+0.91 ± .26		+0.27 ± .34		—0.50 ± .26			—1.39 ± .36
20	+1.00	.21	+1.28	.15	+0.58	.19	.20	—0.42
22	+0.44	.36	—0.29	.30	—0.01	.37	.39	—0.47
24	+0.01	.31	—	.21	+0.05	.28	.38	+0.04
26	+0.11	.49	—	.53	+0.05	.37	.41	—0.06
Av.		±.32 ±.08		±.25 ±.09		±.34 ±.08	±.32 ±.07	

[1] See List of Abbreviations, p. 245.

[2] Not actual positions are given, but difference in position when side fields are exposed as compared with that in the standard (A) tests.

TABLE VII. — SUMMARY OF RESULTS OF TABLE VI.

Number of individuals tested	17
Number of separate series of tests	68
Number of tests	2389

Typical result:
With right field open, line seems inclined upward more to the left.
With left field open, line seems inclined upward more to the right.

		Individuals.	Series of Tests.
	Follow type	13	45
	Show no influence (less than 0.50°)	4	10[1]
Exceptions to Type	(*a*) by both OR and OL influencing in same direction	7 present at least one case; none so on average.	10
Exceptions to Type	(*b*) by both OR and OL showing reverse influence	0	0
Exceptions to Type	(*c*) in relative effect of OR compared with OL	2 present at least one case; none typical	3

The field to the left evidently exerts an influence on the average only about one half as strong as that on the right. For eleven individuals, this preponderance of the right field was evident, ranging in amount from 14% to 66%, and averaging 43% ±18. In case of only one individual was the influence equal, and in two the left field was apparently more powerful than the right.

When both fields were open together, the greater strength of the influence of the right field was again evident (in case of ten individuals out of fourteen). In only one case did the left field show the stronger influence; in three cases they were apparently equal.

When the results for right eye, for left eye, and for both eyes together are separately examined (these differ-

[1] Of these, 4 incline toward exception *a* (none toward *b* or *c*); 2 incline toward type; 4 show absolutely no influence.

ences I have not presented in the tables), there appears no typical difference in the manner in which they are affected by the open fields. The open field on the right, for instance, showed a larger effect on the right eye in case of five individuals, on the left eye in case of seven, an equal effect once. The open fields singly affect both eyes used together: in four cases more as they affect the right eye alone; in one case more as they affect the left eye; in four cases about midway between; in two cases to a larger or smaller degree than either alone. These results are therefore probably quite fortuitous, and there is no indication that any general tendency is followed. Similarly the added influences of the two fields tested separately is for both eyes: in four cases more than for either eye singly; in five cases less; in five cases between the two.

The actual difference between the effect of right and of left field, as shown in the tables, corresponds usually also to the subjective impression of the observer, when any difference is noted. Most observers could detect no difference. Four observers noted that the line inclined away from the open field. Three observers thought that it inclined toward the open field, but this impression was opposed to their actual results in every case, and was probably due to the fact that when the field was first opened the eye actually wandered into it and produced the effect of side-fixation, which afterward disappeared when the verticality of the line was really attended to.

Most of the observers were entirely unconscious of the presence of the visible objects at the moment when the judgment of the line's verticality was made. For instance: "Sometimes notice their presence, more often not; in open field tests, hardly any attention is actually given to objects, the verticality of the line being the only thought and clear perception" (Observer No. 1). "The open fields seem to

make no difference; would n't have known they were there" (No. 20). "When judgment of line was made, not at all conscious of open field being there" (Obs. 22 and others). Similar remarks were frequent. One observer, however (No. 31), claimed that he was conscious, in judging the line, of the presence of the side fields when open; and his results show an unusually large degree of the typical influence. Still another observer (No. 21) discovered that he could make his judgments either while neglecting entirely the open field, or while fully and clearly aware of its presence during his observation of the line. Separate series were therefore tried in his case, in one of which the peripheral objects were neglected, and in the other were considered, as fully as possible. In both cases the results showed the typical influence, but much more strongly when he took the objects into conscious consideration. The results of these two methods in his case are averaged together in Table VI, but are shown separately in Table VIII. Testing this distinction on myself, I have found either no difference at all in the results, or a decided lack of uniformity.

TABLE VIII.[1] — RELATIVE EFFECT WHEN SIDE FIELDS ARE DELIBERATELY NEGLECTED WHEN OPEN, OR ARE TAKEN INTO CONSCIOUS CONSIDERATION. FEBRUARY 13, 1904. OBSERVER NO. 21.

	Average, Neglected.	Average, Considered.	No. of Tests.
OR	$+0.99 \pm .23$	$+1.65 \pm .28$	33
OL	$-0.14 \pm .30$	$-1.55 \pm .43$	30
Difference	-1.13	-3.20	

2. *Influence on variability.* — From the preceding tables it is evident that the amount of variation from the average in establishing the verticality of a line is about

[1] See list of abbreviations, p. 245.

the same whether both fields are closed, or that on the right is open (±0. 32°); is slightly greater when the left field alone is open (±0. 34°); and is considerably lessened when both fields together are open (±0. 25°). The same fact can be shown by another method of computation. If, when the difference between the variability of the measurements of type A and that for the open fields is small, we assign each such case an arbitrary value of 1; when the difference is medium, a value of 2; and when the difference is large, a value of 3; and then multiply the number of cases of each kind by its arbitrary value, add together the results, and compute percentages, we obtain Table IX. It is clear that whether we evaluate each single series of measurements separately, or evaluate the average of all series of tests made by each individual, the results corroborate the conclusions announced above.

TABLE IX. — RELATIVE VARIABILITY.

	By General Average of Each Individual.			By Separate Series of Tests.		
	Less than for A.	Equal.	Greater.	Less.	Equal.	Greater.
OR	14%	72%	12%	23%	48%	29%
OL	12	67	21	29	30	41
OB	59	12	29	50	28	22

3. *Variability and position as influenced by degree of illumination and thus by the number of distinguishable objects.* — I have made many measurements of the normal A-values at various times, in some of which was used a line illuminated by daylight and thus surrounded by a field presenting various distinguishable features, and in others a luminous line in an entirely dark field. In Table X, I have calculated the average and average variation for each separate series, usually of five or ten mea-

surements, and then the average and average variation of all these average positions, and again of the average variations from them.

TABLE X. — COMPARISON OF LUMINOUS LINE WITH LINE ILLUMINATED BY DAYLIGHT.

	Observer No. 1.		Observer No. 24.		Observer No. 32.	
	Daylight.	Luminous.	Daylight.	Luminous.	Daylight.	Luminous.
R. Eye:						
Number	169	383	10	10	10	20
Av. position						
Average	1.16 R	1.29 R	0.20 L	0.84 L	0.17 R	2.60 R
Av. var.	.44	.70	—	—	—	—
Av. variation:						
Average	.20	.38	.24	.20	.15	.43
Av. var.	.10	.14	—	—	—	—
Both Eyes:						
Number	183	55	26	10	20	35
Av. position:						
Average	0.25 R	1.15 R	0.05 L	0.24 L	0.08 R	1.04 R
Av. var.	.25	.20	—	—	—	—
Av. variation:						
Average	.20	.35	.30	.58	.37	.43
Av. var.	.08	.14	—	—	—	—
Left Eye:						
Number	360	206	10	10	10	20
Av. position:						
Average	0.05 R	1.02 R	0.04 L	0.43 L	0.21 R	1.62 R
Av. var.	.41	.52	—	—	—	—
Av. variation:						
Average	.20	.33	.31	.68	.27	.40
Av. var.	.06	.14	—	—	—	—

	Right Eye.	Both Eyes.	Left Eye.
Average increase in variability with luminous line	+ .14	+ .16	+ .18

The results obtained by means of the luminous line are almost without exception more varied and inconstant than when a line is used illuminated by daylight. The more a given line is surrounded by a field in which numerous varied objects or features of texture and illumination are

distinguishable, the steadier is the eye in regarding it, and the more uniform and reliable the estimates made of its direction. This result fully agrees with that obtained by comparing the field open on both sides with the fully closed field in the other series of results just described, and with the results of the earlier tests. It is also fully supported by introspective observation. The luminous line is felt to be shifty and unreliable. The eye fatigues much more quickly in its examination, and there is a decidedly diminished certainty in assigning to it a final position. With such variability in the results of attempting to determine a normal average for the apparent vertical when conditions are made as uniform as possible, it is evident that it becomes very difficult to use the luminous line for determining the influence of any special conditions. Though I have made many trials with it, I have not yet been able to arrive at satisfactory results in an endeavor to determine by its aid the influence of single bright spots or of fixation to one side of the line. What can be splendidly determined by its aid, however, is the effect of voluntary effort to make the line seem inclined in either direction, and the effect of the introduction of predominant muscular tensions to one side or the other. But of these I must write on another occasion.

The apparent position of lines also, as well as the variability, is influenced by the number of distinguishable objects about them, even though the field on either side is apparently of equal importance in this regard. This is shown clearly in Table VI, by comparison of results with both fields open (OB) and those with both fields closed (A); and again in Table X. The conclusion which is seemingly justified by these tables is that the smaller the number of visible objects the greater is the tendency for the line to appear inclined to the left. There is but one

exception to this rule, namely, in case of Observer No. 24; possibly the fact that this observer is left-handed may have some bearing on the result. But even in his case, the greater the number of objects the more truly vertical is the line placed; and perhaps this is the more accurate way to formulate the rule. More recent additional tests with myself as observer confirm these deductions. For these I used another form of apparatus,—a black disk with white thread, about a foot in front of which was a dark screen with a three-fourths inch hole in it. I made tests under four conditions: (*a*) with a luminous line on the old apparatus (or, on the new one, a lessening of the illumination to such an extent that the white line alone could barely be seen); and with the new apparatus; (*b*) with the eye close to the hole in the screen, and nothing but the black disk visible about the line; (*c*) with the eye well back from the screen, the white line visible crossing behind the hole, and many ordinary objects visible in all directions beyond the screen; (*d*) with the eye back as before, and the screen covered over, except at the hole, with a page of newspaper; or with a smaller screen used, so that the surrounding objects approached closer to the line. This gave a series with an increasing number and prominence of visible objects in the successive methods of observation. Table XI gives the results. It confirms the above given rule, and shows that it holds also for horizontal lines. In it the amount of deviation is given as compared with that obtained by method (*d*), which is therefore counted as 0. The + signifies, as usual, for vertical lines a setting-up farther to the right, hence when vertical an apparent inclination farther to the left; and for horizontal lines, an apparent inclination of the right end farther upward. The letters denote the above described methods of observation. It is worthy

of note that by means of method (*d*) I obtained a series of 13 measurements with an average variability of only .005°, by far the most uniform series ever secured, and that many other series showed an unusually small variability.

TABLE XI. — INFLUENCE OF NUMBER OF DISTINGUISHABLE OBJECTS. FEBRUARY AND MARCH, 1906. OBSERVER NO. 1.

	(*d*)	(*c*)	(*b*)	(*a*)
Right Eye				
Vertical Lines:				
Position	0	+ 0.68	+ 1.55	+ 3.87
Number of tests	151	130	40	35
Horizontal Lines:				
Position	0	+ 0.67	+ 0.68	
Variability	± .22	± .35	± .49	
Number of tests	145	21	145	
Left Eye				
Horizontal Lines:				
Position		0	+ 0.81	+ 0.68
Variability		± .16	± .29	± .40
Number of tests		10	10	10

4. *Influence of disturbing sounds.* — In the case of seven individuals, tests were made to see whether distraction of attention by sounds to one side or the other would influence the apparent direction of the line. The sounds were made by means of a noisy motor situated in one series to the right, in another to the left, of the observer, who was not informed that these sounds were deliberately intended as a factor in the investigation. Usually the observer, while aware of the sounds, paid no attention to them. No uniform influence was apparent, either during the actual presence of the sound or as an after-effect during the period of silence that followed.

5. *Some special variations in conditions.* — It is well

known that moving objects are peculiarly insistent in their demands on attention. I tried a short series of tests recently, in which the fingers of one hand were held to one side or the other of a short line (1 cm.), and kept moving about during its examination. The results, to be found in Table XII, show the previous typical influence, slightly increased in degree.

TABLE XII.[1] — MOVING OBJECTS VISIBLE PERIPHERALLY; RIGHT EYE. FEBRUARY 10, 13, 1906; COMPARED WITH PREVIOUS RESULTS FOR RIGHT EYE. OBSERVER NO. 1.

	1906. Moving Objects.	1906. Objects Motionless.	1904. Objects Motionless.
A	(40) 3.00 R ± .33	(5) 2.28 R ± .26	(10) 0.77 R ± .25
OR	(16) 3.45 R ± .35	(10) 1.77 R ± .31	(10) 1.21 R ± .17
OL	(16) 2.63 R ± .25	(10) 1.11 R ± .45	(10) 0.24 R ± .18
Diff.	— 0.82	— 0.66	— 0.97

In order to determine the influence of more usual surroundings, I made a short series of tests with an apparatus consisting of a cord attached to the floor below, moving freely along a horizontal cord above, and seen against a background consisting of the numerous objects of an ordinary living-room. Care was used not to identify its positions by comparison with particular portions of objects seen behind it. The field on either side could be cut off by means of wide draperies hung vertically just behind the line. Testing these conditions with Observer No. 33, he showed a very slight tendency to place the line farther to the right with the left field open than with the right one open; but as these differences were less than 0.50°, they can be regarded as indicating no sure influence. My own results, with five measurements made under each condition, are seen in Table XIII.

[1] See list of abbreviations, p. 245.

TABLE XIII.[1] — LINE SEEN AGAINST BACKGROUND OF NATURAL OBJECTS (FURNITURE, ETC.). FEBRUARY 13, 1904.

	R. Eye.	Both Eyes.	L. Eye.
OR	2.66 R ± .21	1.38 R ± .16	1.30 R ± .08
OB	2.34 R ± .11	1.26 R ± .15	1.40 R ± .20
OL	0.74 R ± .09	0.42 R ± .18	0.08 R ± .10
Difference between OL and OR	— 1.92	— 0.96	— 1.22
Difference by other method (264 tests)	— 0.97	— 1.11	— 1.48

6. *Influence of method of orientation and exploitation.*— In testing the influence of fixating a point situated off to one side of a line, the apparent inclination of the line will differ according as the fixation-point is opposite the bottom or the top of the line; for normally a line so viewed seems to curve concavely about the point of fixation, in case the latter is opposite the middle of the line. It is of interest, therefore, to determine whether a similar difference exists in case of the influence of a field of distinguishable objects situated to one side, the line itself being fixated. Such a field might conceivably influence by attracting the eye unconsciously away from the line somewhat toward itself, or by repelling it to the opposite side; in which case the effects might really be identical with those of side-fixation, and we would expect a difference in the apparent inclination of the line, according as its upper end was attended to, with exploitation downward, or its bottom end with upward exploitation. I tested this difference, though with very few trials, in the case of two observers, and found no difference in result. Moreover all the other observers were allowed to

[1] See list of abbreviations, p. 245.

move the eye freely up and down the line in observing it, and yet their remarks in regard to its appearance show no change in inclination as the eye wanders up and down, and the striking uniformity of results shows apparently that each field exerts an influence in one direction only, however the observer may have viewed the line.

Not feeling satisfied with the sufficiency of these observations, however, I have recently made a renewed attempt to settle this point. As a preliminary, it was necessary to establish the relative effect when the line was fixated at one end or the other, or in the middle, without disturbing conditions. I am still somewhat puzzled by the complexity of the results, and by the difficulty of recognizing exactly what conditions are present in each case. It is certain that a line, whether vertical or horizontal, can be fixated at either end, and with attentive exploitation either toward or away from the point of fixation; or again, without any feeling of an exploiting movement whether of attention or of eye, with either the point of fixation or the peripheral portion of the line emphasized in attention. Moreover the line cannot be examined without an accompanying awareness of the neighboring field on either side of it; and the field on one side is usually more prominent in consciousness than that on the other side. I formulate the following principle tentatively as expressing what seems to me to occur, though I am far from certain that this is a complete analysis of the situation: *Whenever one end of a line is fixated, the peripheral part of the line usually projects into the field on either side toward which attention is predominantly directed; though if, as is less often the case, in trying to determine the relative position of different points, the point of fixation is the more prominent in attention, or if attentive exploitation is directed toward instead*

of away from it, it is this which inclines toward the predominant field. This principle seems to hold of lines running in any direction, — vertical, horizontal, or in the third dimension. Thus, if one fixates the upper end of a line and attends to the relative position of its peripheral portion, its lower end will deviate to the right if attention emphasizes the field to the right, and *vice versa;* but if the peripheral portion is relatively neglected, compared with the point of fixation, or if attentive exploitation is toward the latter, the point of fixation will deviate toward the side of which one is more clearly aware. Similarly, the same four separate cases will exist when fixation is at the bottom point, or at either end of a horizontal line. Table XIV, which confirms and amplifies the indications of Table II, shows for vertical lines the relative influence of these different conditions. The values given are the result of only two endeavors in each case to determine the extreme position of the line which can appear vertical under each of the conditions tested. They are probably too schematic to represent adequately the average of any long series of tests of this nature; but they closely approximate the actual extreme values attainable at the time of the examinations recorded. They support and give definite measurement of the influences announced in the principle formulated above; and in addition they show the possibility of a complicated form of attention which I have designated a "twisted tension," more influential than any other kind, which seems to me to be of frequent occurrence.

With fixation in the middle, or with free movement back and forth along the line, the complexity of results is still further increased. This may be easily understood, if one reflects that in this case exploitation may occur in either direction, or even in both together, and with pre-

dominant awareness of the field on either side of the line. In any case, the neighboring field to one side or the other is usually predominant in its influence. This predominance of one field is, so far as I can judge, always attended by and probably due to a predominant muscular tension to that side. The muscular tension may be set up, appar-

TABLE XIV. — COMBINED INFLUENCE OF FIXATION AT EITHER END OF LINE, ATTENTIVE EXPLOITATION TOWARD OR AWAY FROM THE FIXATION POINT, AND PREDOMINANT AWARENESS OF ADJOINING FIELD ON THE ONE SIDE OR THE OTHER. MARCH 10, 11, 1906. OBSERVER NO. 1.

	Attention emphasizing, or attentive exploitation toward, the point of fixation.		Attention emphasizing, or attentive exploitation toward, the peripheral portions of the line.	
	Attentive Emphasis on		Attentive Emphasis on	
	Field to R.	Field to L.	Field to R.	Field to L.
Fixation B	2.8 R	0.8 R	0.8 R	2.8 R
" T	0.8 R	2.8 R	2.8 R	0.8 R

	"Twisted Tension;" i. e. attentive emphasis peripherally toward field on one side, and at fixation point toward field on opposite side.	
	Peripherally to right.	Peripherally to left.
Fixation B	0.3 R	4.2 R
" T	4.2 R	0.3 R

	Normal Values, without disturbing conditions, average of ten tests each.
Fixation B	1.97 R $\pm$ .17
" T	2.26 R $\pm$ .16

ently, either in response to retinal stimulations, or as a result of central factors, "anticipatory images," or by deliberate effort, — and perhaps also in response to the restless working of some more peripherally situated physiological mechanism. When present, it may be recognized as present, or may be wholly lost in the feeling that the field on one side or the other is for the moment espe-

cially clear. Such tensions or predominant awarenesses are continually occurring and changing spontaneously during the examination of a line; and I find it easy to introduce them voluntarily. Their effectiveness is seen, not only in viewing these vertical and horizontal lines, but in the case of three-dimensional figures also. Consider, for example, one of the figures illustrating the so-called "reversible illusions of perspective." It seems to me that its changes follow this law: *Whenever one of the points of an ambiguous perspective figure is fixated, that point will project toward the observer either in case the peripherally observed parts of the figure are emphasized in attention with accompanying divergent tensions of the eyes, or in case the fixated point is emphasized, whether directly or by attentive exploitation toward it, with accompanying convergent tension.*

Thus a vertical (or horizontal or otherwise situated) line may seem to incline in either direction, whichever end is fixated. Yet there are certain prevailing tendencies. When there are no surrounding objects visible, as in case of a luminous line in the dark, the relative effect of fixating at either end is apparently so easily variable that no fixed tendency can be asserted of it. But in case of vertical lines with visible surroundings, the line generally appears to incline more to the right when the bottom than when the top end is fixated. In case of horizontal lines, the end that is fixated usually seems to be the higher, though the opposite tendency is apparently of rather frequent occurrence. When the middle portion is fixated, the results may be the same as with fixation at either end, or may take a position anywhere between the two. These prevailing tendencies are seen in the measurements recorded in Table XV.

Having established the normal positions for fixation at

TABLE XV.[1] — INFLUENCE OF PORTION OF LINE FIXATED. FEBRUARY, MARCH, 1906. OBSERVER NO. 1.

	Influence Typical				Influence Exceptional			
	Number of Series	Number of Tests	Position	Variability	Number of Series	Number of Tests	Position	Variability
Vertical lines:								
Fix. at bottom...	6	75	1.32 R	±.34	4	50	2.57 R	±.34
" middle ..	6	75	1.44 R	.29	2	20	3.20 R	.35
" top	6	71	1.80 R	.28	4	45	2.22 R	.32
Top °/$_w$ bottom ..			+0.48				−0.35	
Horizontal lines:								
Fix. at left	14	136	1.68 D	.30	4	40	2.76 D	.24
" middle ..	27	253	2.43 D	.26	2	10	2.25 D	.16
" right	14	140	2.50 D	.32	4	50	2.02 D	.26
R. °/$_w$ left			+0.82				−0.74	

either end, I again tried the effect of placing a field of many distinguishable objects on one side or the other. Several different fields were used: the wafers on a page of newspaper, previously described; brightly colored letters and pictures; and two attractive small-figured wall-paper designs. So far as the records show, it made no difference which of these different fields was employed. Again, with over 150 tests on either side in case of vertical lines, and over 200 on either side in case of horizontals, the conclusion announced in the first paragraph of this section seemed at first sight justified: the influence on the inclination of a line exerted by a field of objects situated exclusively on one side of the line is the same, whichever end of the line is fixated. Thus in case of vertical lines, in five series of tests (usually of ten tests each), with the field on the left the line seemed to incline farther to the right than with the field on the right, whether top, middle, or bottom was fixated. In case of horizontal lines,

[1] See list of abbreviations, p. 245.

the more frequent result is for the right end to appear inclined toward the exposed field, whichever end is fixated. This result is somewhat the more certain when fixation is at the left end. In eight series of tests, with fixation at the left end the result was typical in five cases, and no influence was apparent in three cases; with fixation at the right end, the typical result appeared in four cases, the opposite result in two cases, and no influence in two cases.

It seems clear, then, that in any given series of tests a

TABLE XVI.[1] — INFLUENCE OF FIELD OBJECTS ON EITHER SIDE OF THE LINE. FEBRUARY, MARCH, 1906. OBSERVER NO. 1.

	Type I.			Type II.		
	Fixation L.	M.	R.	L.	M.	R.
Horizontal Lines.						
Position:						
OU	+ 0.49	+ 0.85	+ 0.20	+ 0.16	+ 0.25	— 0.25
OD	— 0.25	+ 0.31	— 0.08	+ 0.28	+ 0.47	+ 0.42
OD °/w OU	— 0.74	— 0.54	— 0.30	+ 0.12	+ 0.22	+ 0.68
Variability						
OU	.36	.23	.33	.30	.37	.55
OD	.32	.16	.20	.22	.25	.33
No. of Series	5	3	5	3	3	3
No. of Tests	90	50	100	61	61	51
	B.	M.	T.			
Vertical Lines.						
Position:						
OR	+ 0.18	+ 0.41	+ 0.63			
OL	+ 0.26	— 0.06	+ 0.15			
OL °/w OR	+ 0.08	— 0.48	— 0.48			
Variability						
OR	.23	.24	.30			
OL	.24	.23	.30			
No. of Series	5	6	5			
No. of Tests	90	112	90			

This table shows, not the actual positions given to the line, but the difference between the position without, and that with, a field of objects introduced on one side.

The variabilities given are actual, not comparative.

[1] See list of abbreviations, p. 245.

field of objects situated predominantly to one side of a line tends to exert the same type of influence on the line's apparent direction, whatever portion of the line is fixated. Closer examination, however, does reveal some significant differences. In another series the direction of influence may reverse; and in any one series the influence is not equally strong for fixation at each of the two ends of the line. This is shown by displaying the results as in Table XVI.

Here it is seen that in case of vertical lines the influence of a field on the left as compared with one on the right is to cause the line to appear inclined farther to the right; but this influence is less with fixation at the bottom than with fixation at the top.[1] Similarly, in case of horizontal lines, the influence of a field below the line as compared with that of one above is predominantly to cause the right end of the line to appear inclined more downward when fixation is at the left end, more upward with fixation at the right end. The noting of this fact has at last given me a clue as to the manner in which all these tangled and apparently inconsistent facts may be unified and explained. The following propositions present the conclusions which now appeal to me as probably indicated by the facts: —

a. Fixation at either end of a line is naturally accompanied by attention to the relative position of its peripheral portions, which then diverge toward the field on either side that is most prominent in attention (Table XIV.).

b. The field to the right of vertical lines and below horizontal lines is most easily and naturally attended to,

[1] In the table it appears actually slightly reversed; but this is due to a very exceptional result in one series out of the five. If that series were not counted, it would still appear strongly lessened (—0.10), but not reversed.

when surrounding objects are visible, but without particular predominance of either side. Hence, wherever the fixation, the peripheral portion of the line will tend to project into the field to the right of the line, or into that below the line. In case of vertical lines, with fixation at the bottom, the line will most frequently appear to incline with its top farther toward the right than when fixation is at the top; and when fixation is at the top, the line must be placed with its upper end farther to the right to appear vertical (Table XV). In case of horizontal lines, with fixation at the left, the line will appear inclined with its right end farther downward than with fixation at the right, and therefore in the latter case the right end must be placed farther down in order to appear horizontal (Table XV).

c. The influence of visible objects predominantly on one side of the line reduces to the same uniform principle. Thus, with fixation at the bottom and objects on the left side, the vertical line is placed with its upper end farther to the right, hence seen when actually vertical as inclined farther to the left, than with fixation at the top; and with fixation at the left end, with objects below, the line is placed with its right end farther up, hence seen when horizontal as if inclined farther down, than with fixation at the right end (Table XVI). The effects are of the same nature, though less in amount, as in case of deliberate attention toward the field on one side of the line, affecting the peripheral portion of the line (Table XIV). They are very nearly the same in amount as the typical influences seen in Table XV.

d. From the prevailing tendency shown in Table VI, therefore, it would appear that the majority of observers view the line most naturally with fixation or attention directed toward its middle portion, and attentive exploi-

tation downward; whence would occur the result that, with objects on the right, the lower end of the line would appear to diverge toward the right, and therefore, in order to appear vertical, the upper end would be placed farther to the right. With horizontal lines, in my own case, — I have not tested it with others, — the more usual tendency is, with objects below, to place the line with its right end farther upward, hence to see it when horizontal as inclined farther downward. This would indicate a prevailing tendency to exploit it toward the right. This tendency is modified, of course, when deliberate fixation at the right end is adopted, by the opposing tendency to exploit peripherally and hence toward the left; while the two tendencies agree in case of fixation at the left end, or in the middle, and consequently there is slightly less variability in the latter cases. In case of vertical lines again, a similar conflict occurs between the tendencies to exploit downward and to exploit peripherally, when fixation is at the bottom; while the two agree when fixation is at the top, in which case there is again less variability. Even in the cases of conflict, the downward-rightward tendency for vertical lines and the rightward-downward for horizontal lines predominates over the peripheral tendency, and the latter then diminishes but does not usually overbalance the effect of the former. The conflict always introduces a greater variability. The peripheral tendency more easily overbalances the other tendency, when in conflict with it, in case of horizontal lines than in case of verticals, doubtless because in the latter case the rightward tendency is but slightly more natural and predominant than that in the opposite direction. All of these deductions are supported by the facts shown in Table XVI.

e. When the number of surrounding objects visible

about a line diminishes, and there is no predominance in relative importance of the field on one side of the line over that on the other, there is a strong tendency for vertical lines to appear inclined more toward the left, and for horizontal lines more upward (Tables IV, X, XI). In general, the larger the number of objects, the more truly vertical or horizontal is the line placed. One striking difference, however, appears to exist in this respect between vertical and horizontal lines. With many objects about, the naturally stronger influence of the field on the right side of vertical lines is opposed and diminished, but not overcome, by the simultaneous influence of the field on the left. As the number of visible objects grows less, the natural predominance of the field on the right increases, and since it is accompanied by a natural exploitation of the line downward, the lower end diverges toward the right, and to appear vertical the upper end must be shifted more and more toward the right. When no surrounding objects can be seen at all, as in the case of the luminous line, the rightward tension still strongly persists.

These are the tendencies that appear when the right eye alone is used. For the left eye, a greater complication seems to exist. When many objects are present, the rightward tendency still predominates; but there occurs with it, apparently, a tension toward the left, which increases as the objects decrease in number or in illumination, and finally leads to an apparent inclination of the line with its upper end toward the right, the direction of exploitation being downward, as for the right eye (Table IV). It is possible that the tendencies for either eye of left-handed people is the same as those here noted as applying to the left eye (Table X, No. 24).

In the case of horizontal lines, there is no difference between left and right eye (Table XI), but there is for

either of them a conflict of sidewise tensions, as in the case of the left eye with vertical lines. With many objects visible, the predominant tension is downward (as shown in paragraph *b*, above). But with a decreasing number of objects this is supplanted by an upward tension, which, joined with a rightward direction of exploitation, causes the right end of the line to appear inclined farther upward, and hence to be placed, in order to appear horizontal, farther downward (Table XI).

f. Though these are the prevailing tendencies, yet it is inevitable that many exceptions should occur. It is most natural, when fixating a given portion of a line, to exploit outwardly from it and thus attend prominently to the peripheral portions of the line. But the reverse of this may easily occur, in which case, not the peripheral portion, but the point of fixation, will diverge toward the field on the side of the line which obtains most vigorous attention. Sometimes in conflict with this tendency is another natural tendency to exploit vertical lines, in attention at least, downward, and horizontal lines toward the right; but this, too, is frequently reversed. Again, it is natural to be most clearly aware of the field to the right of vertical lines and below horizontal lines, when little difference exists in the relative prominence of the fields on either side; or to attend to the more prominent of two fields which differ widely. But again it is exceedingly easy to turn attention to the other field. Prevailing tendencies exist, but their existence and nature can be established only by numerous observations, because during the examination of a line they are continually shifting and changing, and thus producing opposing results.

Moreover, since all these directions of exploitation, predominant attentions to one side or the other, and the like are almost inevitably interpreted in clear conscious-

ness as a particular inclination of the line itself, it is exceedingly difficult to make a reliable introspective analysis of the conditions actually present. My own analyses are based, partly on introspection, rendered more reliable by long observation of facts of this sort, though still far from unambiguous; and partly on the results of actual measurements, as given in the tables, but with so many conflicting indications that I cannot be entirely sure of the validity of my deductions. The hypotheses developed above to account for the results are the only ones which at present seem to unify the entire series of observations; but in view of the enormous complexity of the problem, it is not impossible that further research may necessitate a modification of some of them.

C. SUGGESTIONS TOWARD THEORY OF EXPLANATION

Among the main facts brought out by this research are, in the first place, the existence of certain predominant tendencies of exploitation, whether of attention only or of actual movement; and of a tendency to be most clearly aware of portions of the field of view lying in certain particular directions from the momentary point of fixation. These tendencies are probably due, some of them to natural physical conditions, some of them to acquired habits. When objects are present, I assume that it requires somewhat less effort to execute movements downward among them than in the upward direction, and that this accounts for the downward tendencies of exploitation, when present. When externally stimulating objects are absent, the eyes tend to assume the position of rest, in which they are rolled upward and outward. This would probably account for the upward tendency seen in the case of horizontal lines when few objects are visible, and in part also for the rightward tendency of the right eye, and

the leftward tendency of the left eye, in the relative absence of visible objects. A further reason for the latter difference may possibly consist in the greater emphasis felt rightward when the right eye alone is used, and leftward in case of the left eye; and in the greater extent and prominence of the field to the right in case of the right eye, and to the left in case of the left eye. When numerous surrounding objects are present, the rightward tendency is very likely due to our habits in reading and writing, which in turn are based on our prevailing right-handedness.

A second result of the research is the establishment of the fact that when distinguishable objects are present predominantly on one side of a line, they tend to cause those portions of the line to apparently deviate toward themselves, which, whether fixated or examined peripherally, receive most emphasis in attention. This fact is more difficult to explain. A number of possibilities suggest themselves, and their full elaboration would require a long discussion. I will briefly sketch the more important among those that have occurred to me.

1. The results might be due largely to the operation of central factors, — to the manner of apperception or interpretation of the visual impressions. The expectation of results of a certain type, a half-formed theory that they ought to be explainable in a certain manner, could certainly influence the actual appearances. That this has not been operative in this case is indicated by the fact that the results have always been varied and confusing, that my anticipations have been over and again contradicted by the facts as they developed, and that not until the very day of writing this paragraph have I been able to work out to a satisfactory conclusion the unifying principles that now appeal to me. Or some kind of suggestive or

attractive influence exerted by the neighboring objects might be supposed to influence the interpretation of the line's position; but I can think of nothing plausible of this nature. To be sure, the visual impressions have to be interpreted before they can mean anything at all. But they can receive interpretation only on the basis of previous experience, and I think we are justified in believing that all spatial interpretations are derived from definite experiences of movement, and that they can be made only when there are present either actual movements or muscular tensions that represent them. Even an anticipation or bias or suggestion can be effective only in case it introduces the appropriate muscular reaction as a basis for the spatial qualities that are perceived.

2. The results might possibly be identical with those of fixation in the field off to one side of the line. This explanation would naturally occur to one familiar with the facts that such side-fixation affects the apparent inclination of a line, that the eye is constantly making slight undetected movements about its point of fixation, and that peripherally seen objects tend to make the eye turn toward themselves. It would seem, then, that the presence of such objects might easily cause a slight unconscious deviation of the eye-direction from the line. To be sure, the results of side-fixation themselves need explanation, and I propose to discuss that matter at another time. It is sufficient now to point out that this is not the influence at work here (at least, not the sole influence), for the following reasons: —

a. The results agree with those of side-fixation in only a certain proportion of the cases. Thus, with objects on the right, fixation at the upper end and exploiting attention downward, the lower end of the line apparently deviates toward the right, as it naturally would in case the

actual point of fixation unconsciously diverged somewhat into the field to the right of the upper end. But with fixation at the lower end and exploiting attention still downward, the line's apparent inclination remains as before, although the opposite inclination would result if it were due to a deviation of the point of fixation to the right of the bottom of the line. If the results were due to side-fixation, they should uniformly differ according as fixation is at the one end or the other of the line; they actually differ only in case attentive exploitation is in each case peripheral, and not in case it is, as frequently happens, uniformly downward or rightward, whatever the point of fixation.

b. Actual examination of the eye during observation of a line shows that its direction of regard may be toward either side of the line, independently of the latter's apparent inclination. I have established this in two ways. First, with the head firmly fixed in a head-rest, I examined the eye through a microscope and watched its movements. While I could not thus determine its actual fixation-point with reference to the line, yet I observed that the changes in apparent inclination of the line, and also changes in voluntary attention toward the field on the right or on the left of the fixation-point, were entirely independent of the actual changes in position of the eye. In the second place, I obtained a strong after-image of a bright vertical and horizontal cross, and projected this onto the base of the line. By its position with reference to the line, I could determine accurately whether fixation was actually on it, or slightly to the right or the left; and in whichever position it was, the line might appear inclined in either direction, or attention might be directed voluntarily predominantly to the field on either side. The prevailing tendency, in ordinary fixation, was for the line to

appear inclined with its peripheral part deviating toward the side on which deviation of the eye's direction occurred; and in case of attention to one side, for the eye to deviate toward that side. But the opposite conditions occur with sufficient frequency to prove that the line's apparent direction is entirely independent of the influence of side-fixation.

3. The only view that appeals to me as at all adequate to account for the facts is that the variations in the line's apparent direction are due to the presence of particular muscular tensions. I believe this for several reasons. In the first place, I can see no other way to clearly account for the existence and details of the manner in which we perceive the spatial characteristics of objects. Then further, such tensions do exist and can be voluntarily introduced, and when so introduced they do affect the apparent inclination of lines. Again, after long study over this problem, I have often seemed to be able to detect their presence and nature, and the manner in which they influence the line's direction, when they were not voluntarily sought; but I cannot do this always, nor in every case reliably. And finally, it seems to me that these tensions must unavoidably occur, and that when present they furnish the same type of feeling as is derived from actual movements along a line with the inclination which the line under examination seems to possess.

Visible objects tend to cause the eye to turn toward them. If the eye does not actually turn, nevertheless a corresponding tension is introduced, balanced by an opposing tension which prevents movement. Neither of these tensions is ordinarily noticed as such, but mingled with the tensions aroused by the line itself, they contribute to its spatial interpretation. A line's direction is primarily judged by the particular feelings of movement that arise

as the eye glances along it, apperceived by the aid of numberless previous experiences of eye movement correlated with hand movement. If the eye does not glance along the line, but rests on some point within it, and attention alone exploits it, a set of tensions is aroused that takes the place of the actual movement and receives the same interpretation. I assume that when a line's direction is wrongly judged, because of the presence of other objects, the combined tensions from line and from objects furnish the same total feeling as would be derived from the examination of a line having the actual inclination which the line in question appears to have. It is a matter of identical sensory elements derived from muscular activities receiving the same interpretation. In my previous paper I have discussed this at somewhat greater length, though still inadequately; and I have now worked out in much greater detail the explanation of exactly what occurs. But the full explanation involves so many intricacies that I must postpone its further elaboration. Just now I must content myself with the statement that I know that muscular tensions of this nature exist and modify the apparent direction of lines; and with expressing my belief that they furnish the ultimate explanation for all of the spatial facts recorded in this paper.

The more I study this problem the more am I convinced that muscular tensions furnish all the material that is worked up into the spatial details of our perceptions. But we never normally detect them as muscular tensions. In the dark, or with closed eyes, they are probably present, constantly surging and changing because of varying and untraceable inner physiological stimuli, but they pass undetected when there is no sensory material to which they can be applied. With a single object, such as a line, in view, they tend to apply themselves

spatially to it, unless its position is such as to make this impossible because of too great divergence. And still they are not felt as tensions, but as space qualities of objects, unless they are unusually intense, or unless practice enables one to detect them more readily.

Still a third and final important result of this research is the clear proof of the fact that there is less variability in the perception of a line's direction, and in other spatial judgments, when a multitude of objects is visible peripherally. The reason for this seems evident. Apparently we can execute with care and delicacy no movements unless the muscles concerned maintain within themselves a degree of constant tension or tone, balanced and controlled by a corresponding tone in opposing muscles. This muscular tone is not steady, but ever changing, and the muscle is therefore in constant slight oscillation. The more energetic and well we are, the more of energy is devoted to maintaining these tensions, and the smaller are the consequent oscillations or tremblings, and the greater our control in the execution of desired movements. In case of the eyes, their tone is apparently maintained largely by the stimulation of outside objects, though it is subject also to constantly changing inner stimuli or central innervations. Its variations are many and confused, and we are unable to grasp them in their nature and significance, unless there are light sensations which can be fused with them into a spatial perception of objects. Experience has given us no data whereby the bare tensions can call up by association the appropriate elements of hand and body experience, and thus get apperceived as meaning either movement, position, or external space. This is largely because, in the absence of external stimuli and their corresponding tensions, the constantly varying

tensions due to inner causes bear so large a proportion to the slight impressions aroused by the eye's own position and movements that they completely overshadow the latter, and the total complex can have no definite spatial meaning. For that reason we do not feel the movements of the eyes with any delicacy when the eyes are closed. We cannot predict with any accuracy on what object the gaze will immediately fall on opening the eyes. Most persons are not even aware that the eyes tend to roll upward and outward when they are closed and relaxed. If one look at an intermittent single light in the dark, such as that of a flashing lighthouse, and try to maintain the same direction of gaze while it is gone, on its reappearance one will find himself looking somewhere else.

With very little of external stimulation present, the inner tensions still make up so large a proportion of the total tensions, that their changing and unreliable nature characterizes such spatial interpretations as are made. Consider attentively, for example, a meagre constant stimulus, such as that of the luminous line used in some of these experiments, with no other objects visible. The line's position cannot be accurately judged. It seems to ceaselessly shift and waver, drift about, change in its distance, its direction from the observer, and its own inclination, under the influence of tensions which are kept in restless variation by the inner stimuli. The changing tensions are applied to the spatial interpretation of the only object that is visible. Introduce other visible details, with their corresponding definite tensions, but leave them still relatively insufficient, as when we stand in lofty places with few things visible immediately around us, and confusion or dizziness is apt to occur. Or let the visible details fail to arouse definite tensions because they are kept too rapidly shifting, as when, in vertigo from turn-

ing around, the eyes keep moving unconsciously quickly in one direction and more slowly in the other, so that the objects, seen vaguely only during the slower movements, seem to glide away constantly in one direction; again dizziness and confusion result, with no very definite spatial feeling except that of the movement of the objects. Or let the confusion be due to the first heavy moments of waking from a deep and insufficient sleep, or to the diminished power of coördination brought about by alcohol or drugs; again, the eye tensions, with their resulting control of movement and perception, are lacking. Whenever tensions definitely corresponding to the spatial characteristics of external objects bear a relatively small proportion to the tensions of inner origin, the perception of those objects is unreliable and wavering. Moreover, the proper tone in the other muscles of the body, and thus their adequate control, seems to depend largely on the presence of abundant and well-coördinated tensions in the eye muscles aroused by external stimulation; for the above enumerated conditions wherein these latter are relatively lacking are very apt to be accompanied by a general trembling and tottering and stumbling about. Under similar conditions mental steadiness, clearness, and control diminish also. A failure to grasp clearly the nature of one's surroundings, to apperceive definitely the spatial relations of things, leads to mental confusion. A badly blurred page of print, the eye's uncontrolled movements in vertigo, a sudden rise from a stooping position causing a disturbance of the equilibrium of circulation, a series of events too complicated and rapid to make their clear comprehension possible, — in all these cases the muscular tensions of the eyes are too confused to gain clear interpretation, and the mental confusion that results, for a moment at least, is not merely in regard

to the objects themselves, but is one that affects other conscious processes as well. During a prolonged sitting in the dim light of a spiritist séance, it is not merely the sitter's desire and expectation that account for the frequent lack of good observation and sound judgment, nor his usual lack of training in accurate observation and the unfavorable conditions for it that exist; the steady muscular tone given by the presence of external objects is wanting also, with shifting inner tensions in its place, and this condition doubtless contributes to the increased suggestibility and diminished mental control. Every one who has taken an overdose of alcohol or of some other drugs knows that the whirling inner processes and the bodily disturbances can be controlled best if the eyes are kept open.

It requires, then, the numberless stimuli of our ordinary conditions of vision, producing a mass of varied but well-ordered and clearly related muscular tensions, to secure accurate and uniform observation of things in their spatial relations, and usually also to make a well-regulated control of muscular and mental activity possible. That this is true of perception of the direction of lines is clearly shown in the experiments of this research by the lessened variability and greater accuracy of the results, whenever many surrounding visible objects were present.

SUMMARY

The number of conditions affecting the apparent direction of a line is very large, the conditions are constantly and unconsciously varying in the manner in which they mingle together, and the complex thus formed cannot, in any given series of tests, be thoroughly and satisfactorily analyzed. An attempt to determine the influence of any one condition cannot, therefore, be unaccompanied by ap-

parently varying and conflicting results, especially if the influence under consideration be a slight one. As a result of long and varied experimentation, however, the following conclusions seem justified: —

1. Exploitation of a line by actual movement of the eye may occur in either direction; and in the absence of actual movement, attentive exploitation may be directed either toward or away from the point of fixation.

2. During examination of a line, there is always some awareness also of the field surrounding it; and this awareness is much more apt to be predominantly of the field to one side of the line than of both fields equally.

3. By practice one can acquire a certain degree of voluntary control of the direction of exploitation and of side-awareness; and then it can be seen that always that portion of a line, whether it be fixated directly or examined peripherally, toward which attentive exploitation is directed, appears to be displaced toward the side field which receives most emphasis in attention.

4. Though voluntarily either direction of exploitation and of side-awareness may be secured, and though spontaneously these are frequently changing, yet certain prevailing tendencies exist. These are as follows: —

A. In case of vertical lines: —

a. For the right eye, attentive exploitation occurs most easily and normally downward[1]; though a second strong tendency, conflicting with that just mentioned in case fixation is at the lower end of the line, is for attention to exploit toward the peripherally seen portions of the line.

[1] This tendency is asserted only of the conditions under which these experiments were made. Certain facts of æsthetic appreciation seem to involve a prevailing tendency toward upward exploitation. The tendency probably differs, therefore, under different conditions whose exact nature cannot yet be determined.

Side-awareness is directed most frequently and naturally toward the field on the right of the line.

b. For the left eye, attentive exploitation has the same tendencies as for the right eye.

Side-awareness is directed predominantly toward the field on the right when there are visible objects within it; but toward the field on the left in the absence of visible objects.

B. In case of horizontal lines: —

For either eye, attentive exploitation is directed most naturally toward the right; though in second degree a strong tendency, conflicting therewith in case fixation is at the right end, exists to exploit toward the peripheral portions of the line.

Side-awareness is directed predominantly toward the field below, when objects are present; but toward the field above, in the absence of objects.

5. These prevailing tendencies produce different results (*a*) when surrounding objects are visible, situated predominantly to one side of the line; (*b*) when surrounding objects are visible, with neither side predominant over the other; and (*c*) when there are no surrounding objects visible. The effect of objects predominantly to one side is to cause the end of the line toward which attention or exploitation is directed to be displaced apparently toward the predominant field. In case of vertical lines this will usually be the lower end of the line; though on account of the conflict in tendency when fixation is at the lower end, this effect in such case will be diminished, although rarely actually reversed. In case of horizontal lines, it will usually be the peripheral end that is displaced;

though on account of the rightward tendency, this will occur more often when fixation is at the left end than when it is at the right. A single object visible in the side field, such as a single bright spot in an otherwise blank field, will produce these results to some degree. The influence will be larger the more prominent the object, the more strongly it attracts attention, the more numerous the objects visible predominantly in one direction, or the more closely they approach to the line.

6. When many objects are present, clearly visible and predominant on neither side of the line, whether or not their presence is consciously noted, their effect is the production (1) of greater accuracy and (2) of greater uniformity in estimating the line's direction. The influences of the separate fields nearly balance one another ; and yet for vertical lines the influence of the field to the right, and for horizontal lines that of the field below, is the stronger.

7. In proportion as surrounding objects diminish in number, or as their prominence diminishes either because of their own nature or of lessened illumination, the following tendencies increase, sometimes in agreement, sometimes in conflict, with those noted above: —

A. In case of vertical lines: —

a. For the right eye, the downward-rightward tendency causes the line to appear with its upper end displaced more toward the left.

b. For the left eye, the downward-leftward tendency causes the line to appear with its upper end displaced more toward the right.

B. In case of horizontal lines: —

For either eye, the rightward-upward tendency causes the line to appear with its right end displaced more upward.

C. At the same time, the variability of all estimates of the line's direction is very greatly increased.

8. Similar tendencies exist for the perception of directions in the third dimension. These do not come within the scope of this paper, but the following principle, applicable to figures of "reversible perspective," seems to follow from the tendencies here noted, and to be supported by observation: Whenever one of the points of an ambiguous perspective figure is fixated, that point will project toward the observer either in case the peripherally observed parts of the figure are emphasized in attention, whether directly or by attentive exploitation away from the point of fixation (often simultaneously in all directions), with accompanying divergent tensions of the eyes; or in case the fixated point is emphasized, whether directly or by attentive exploitation toward it (often from all different directions simultaneously), with accompanying convergent tensions. The opposite effects will be produced, of course, when the tensions in each case are of the opposite nature.

9. The facts here summarized find their explanation, in all probability, so far as they have to do with the presence of surrounding visible objects, in the influence of the latter on eye-movements or on muscular tensions representative of them, whose sensory correlates, in combination with other sensory and apperceptive material connected with them into definite complexes, constitute the spatial interpretation of objects.

10. Numerous other influences besides the prevailing tendencies of exploitation and of side-awareness and the influence of distinguishable objects, determine the apparent directions of lines. They have been discussed briefly by me elsewhere, and will probably receive more extended discussion hereafter.

X

BEGINNING A LANGUAGE; A CONTRIBUTION TO THE PSYCHOLOGY OF LEARNING

Edgar James Swift

Previous investigations in the psychology of learning have dealt with feats of muscular skill or with activities in which the physical was at least as prominent as the mental. The purpose of this investigation is to bring the work closer to the schools, to find out how far the principles already established apply to school studies, and to get the curve of learning for one type of school subjects.

The nature of the investigation and method of procedure. — A language was chosen because of the comparative accuracy with which the rate of progress could be measured. In selecting the particular language it was important to find one in which the subject's previous studies would be of least assistance. The Romance languages were, of course, excluded on account of their similarity to Latin. The choice finally fell upon Russian because, while meeting the other requirements of an investigation, there are two fairly good beginner's books.

The investigation was begun March 30, 1905, and ended June 14. The experiment consisted of thirty minutes' study immediately followed by a fifteen minutes' test of reading ability. The daily preliminary study of thirty minutes was carried on in a perfectly natural way, the time being divided between the vocabulary of the lesson to be read in the following test, conjugations, de-

clensions, and practice in reading review exercises, as the needs of the day suggested.

In the writer's previous investigations in the psychology of learning the subjects exerted themselves to their utmost to make a record, but in this experiment, though every moment was utilized, there was no attempt to "spurt." The work in both the study and the test was done without strain, and for that reason the result is more nearly comparable with that of the school.

The curve is based on the number of words read during the daily fifteen minutes' test.

Certain rules of procedure were necessary, and the following were decided upon at the beginning, and strictly adhered to throughout the investigation.

1. Proper names were not included in the count.

2. When the same word was immediately repeated so that the knowledge was directly carried from one to the other the word was counted only once.

3. When an intelligible meaning could not be found for a sentence the words were not counted.

4. If, at the close of the test, a sentence was left unfinished, only those words were counted whose significance was clear in connection with the meaning of the sentence to that point.

5. During the test the vocabulary of the lesson was covered with paper and not referred to until the attempt had been made to find the word in the general vocabulary at the end of the book, and also in the vocabulary of the reader. If the word was not found in either of these places it was then sought in the vocabulary of the exercises for the day.

The work of the investigation was the first thing undertaken in the morning. The subject (the writer) after reaching his office spent fifteen minutes looking over the

morning paper so as to "cool off" mentally after the half hour's walk from his home. He was very careful to maintain the same routine of daily life throughout the investigation so as not to complicate conditions. Immediately after the test was finished the work was thought over and any points that bore upon the investigation were noted. The particular lesson and sentences entering into the test of the day were also recorded in order that their ease or difficulty might later be considered in interpreting the curve.

The books used were Mott's Elementary Russian Grammar and Werkhaupt and Roller's Russian Reader. The exercise sentences of the grammar were taken in order first, and when they were completed the reader was begun. There was no skipping, except that when a sentence was not finished in the test of one day the test of the following day commenced with the next sentence. The grammar work kept pace with the exercises to be read. As the exercise sentences were not numerous enough to call for more than one or two days on a single lesson, the forms could not always be thoroughly committed to memory. This was particularly true of the verbs. The writer suspects, however, that this is not very different from the condition of the average schoolboy when he goes to his recitation.

The test was made daily, with the exception of Sundays, and the condition of the subject was always carefully noted.

The subject had never before looked into a Russian book and knew absolutely nothing about the language. As a preliminary preparation for the investigation two hours were spent in studying the alphabet. This time was distributed over four days, one half hour on each of these days being given to it. At the end of these four

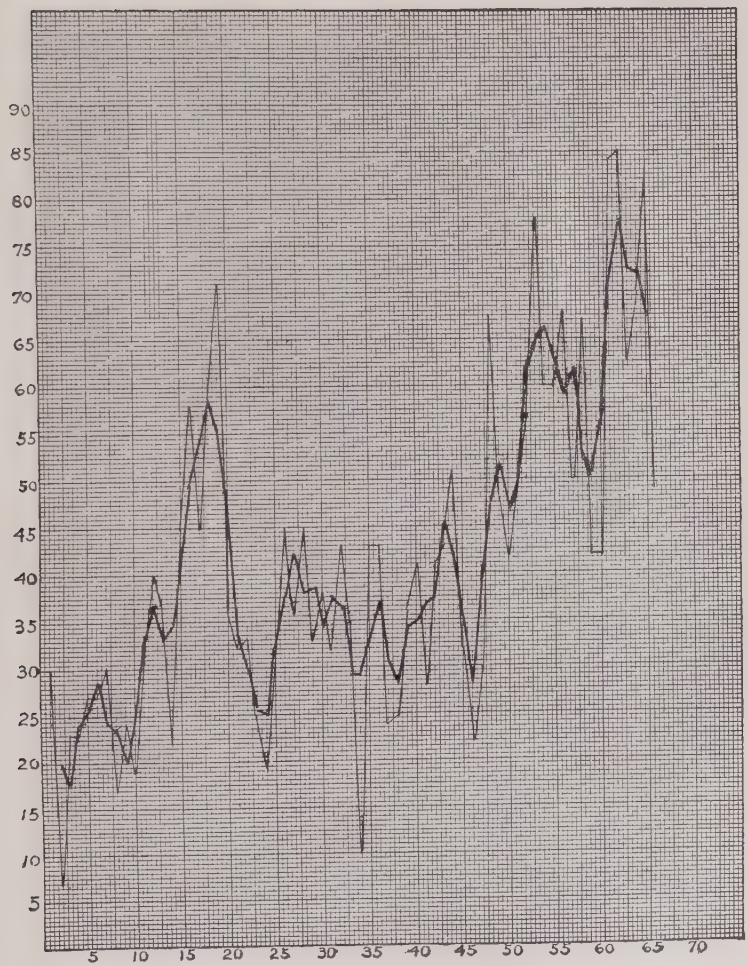
days the investigation took the form that has been described, one half hour of study followed by fifteen minutes of test. Aside from the two hours of study of the alphabet, the daily half hour of study was all the time that was ever given to the language, excepting, of course, the fifteen minutes' test, until after the completion of the investigation. Only twice was help obtained, and then only in getting the meaning of two words whose irregularity prevented the learner from finding them in the vocabulary, and which were causing confusion by their frequent occurrence.

The following curve was traced from the number of words translated each day during the fifteen minutes' test. The days are indicated on the horizontal base line, and the number of words read on successive days appears on the perpendicular line at the left.

Description of the curve and discussion of its form. — The high record of the first day indicates a certain control of letters, and marks the rise from zero knowledge. The lesson for this day consisted merely of words in the nominative case, which were found without delay, and two or three sentences so short and easy that the translation required no time when once the meaning of the words was known.

On the second day noun cases entered into the work, and for this reason the words were not so readily found. A few of the real difficulties of the language for which knowledge of symbols was inadequate were now for the first time encountered, and so the score dropped.

It will be seen from the curve that six days were needed to equal the record of the first day, and even then this level was not held. Indeed, even on the forty-sixth day, as the curve shows, the score dropped to twenty-two words, while on the thirty-fourth day only ten words were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read. The reason for this low record appears from the notes for that day: "New words and obscure expressions prevented progress."

In interpreting the significance of the great variations in the curve, the sudden rises followed by an equally sudden drop, it must be remembered that the subject was handling a tool about which he knew very little. If the declension of the words in the exercises was regular, the work was likely to go smoothly, and the resulting score would be high. But if a case-form so irregular as not to be readily recognized appeared, the delay might be so great as to markedly reduce the score for that day. The learner's knowledge, however, would not be fairly represented by the day's record. This shows his deficiency rather than his power. Ordinarily, even at that stage of progress, he would do better, as the subsequent, and in many cases also the previous score shows. But as yet he cannot be depended upon in an emergency. His knowledge is still limited in quantity and superficial in quality. The subject himself was conscious of this, and it was not until about the fifty-third day that he began to feel a little confidence in his knowledge. The notes for that day say, among other things, "the difficulties seem to be settling somewhat, but words are still hard to remember."

The phenomenal rise on the sixteenth and nineteenth days seems to have been due, in part, to easier translation material. The sentences for those days were respectively illustrative of the interrogative and negative forms of regular verbs and of demonstrative pronouns. The time for advance had probably come, but the rise was too great to be ascribed solely to the learner's progress. Thirty-four days of study were needed before that height was reached again, and to the end of the investigation it was not permanently held. All of these noticeably high records that

are not made again for some days indicate that the learner has temporarily overshot his permanent power, and, as will be shown later, time is needed to perfect the automatization. The same fact was observed in the investigation of ball-tossing and of typewriting.

New words, not given in the vocabulary, and obscure expressions, caused the exceptionally low record of the thirty-fourth day.

The rate of measurable progress at the beginning was much slower than in learning typewriting.[1] This is seen in the length of time that passed before a much higher level than that reached during the first few days was permanently gained. The ascent is not so sudden nor so continuous as in typewriting, and for that reason the curve is more nearly of the concave type. The reason for this is that in typewriting all the symbols were partially learned at the start, and the remainder of the time was given to automatizing this knowledge. In Russian, however, each day added new words and new grammatical forms. Then, too, since the test exercises for a given day dealt especially with the subject-matter of the lesson, what had been learned in the past did not count greatly toward the translation. The grammar work, with its test sentences, was finished, and the reader begun, on the forty-third day, and from that time the rise was less interrupted.

The general form of the curve will be more clearly seen in the smoothed curve marked by the heavy line.[2]

[1] Cf. curve for the acquisition of skill in typewriting, *Psychological Bulletin*, vol. i, 1904, p. 297.

[2] The method used in smoothing was to average the scores for the first three days, then those for the second, third, and fourth days, next those for the third, fourth, and fifth days, etc., to the end. Naturally smoothed values could not be given for the first and last days. Consequently these days are not represented in the smoothed curve.

Discussion of the results in the light of introspective notes. — It will be seen from the curve that there are three periods of manifest advance, and four "plateaus," the last plateau coming at the end of the investigation. Since plateaus seem to indicate that the learner is making no progress, their real significance is a matter of considerable interest. Bryan and Harter interpreted them to mean "that the lower-order habits are approaching their maximum development, but are not yet sufficiently automatic to leave the attention free to attack the higher-order habits."[1]

This investigation sustains the view to which the writer has been led by former studies, that there is no such separation of "lower" and "higher-order" habits. In this investigation, as in the experiments on ball-tossing[2] and typewriting,[3] "higher-order" habits made their appearance early in the work. At first they were fugitive and not easily detected, but very soon one or two became sufficiently permanent to be clearly observed. It was noticeable, however, that extreme sensitiveness to conditions marked even this latter stage. A slight fatigue, or any mental disturbance whatever, drove them away and the subject at once sank to the level of "lower-order" habits. It would seem from this investigation, as well as from those previously made by the writer, that the difference between earlier and later stages of the learning process does not consist in the absence, in the former, of "higher-order" habits acquired only after those of the "lower order" have become automatic, but rather in the predominance during the earlier stages of "lower-order" habits and the gradual self-assertion of those of

[1] *Psychological Review*, vi, 1899, p. 357.
[2] *American Journal of Psychology*, xiv, 1903, p. 201.
[3] *Psychological Bulletin*, i, 1904, p. 295.

a "higher order." Both kinds of habits were in process of formation almost from the beginning, and, as the investigation ended before the subject had acquired any great proficiency in the work, both were conspicuous to the close. Introspection made it clear, however, that very early in the work, perhaps on the second or third day, a few common words of two, and possibly, in a few instances, of three letters were recognized at sight, while all others had to be slowly pronounced before they could be recognized, and that, too, regardless of the number of times they had already been seen. As the ability to recognize words at sight is a "higher-order" habit, at least when compared with the need for slow and labored pronunciation, it will be interesting to trace its growth. On the sixth day the subject wrote in his notes, "with the exception of common words of two and, in a very few instances, three letters, no word, however many times it may have appeared, is recognized until orally or mentally pronounced." Again, the notes for the next day tell us that "in two or three instances words previously requiring pronouncing were recognized at sight." By the ninth day this power had increased so that "two or three reasonably long words were recognized at sight." Among them were the verb meaning "to speak," and the noun for "boy." The following day this list was increased by the words signifying "to play," "cat," and "with." Still, notwithstanding the early appearance, and, at the outset, at least, the seeming rapid growth of this power, throughout the entire investigation words that had appeared many times, and, on occasions, had been recognized at sight, would require pronouncing, and even then, in many instances, the meaning would not come. Again, visualization of words, also one of the "higher-order" habits, was observed on the fourth day. "To-day

for the first time," wrote the subject in his notes, "I was able to get the faintest suggestion of a visual image of two or three words that I was learning to decline." The increase of this power, while exasperatingly slow, was nevertheless noticeable. The fact that the subject is, in general, a poor visualizer naturally retarded the growth of this power.

The curve would seem to indicate that during the plateau periods no progress is being made, but careful observation of himself, in this investigation, and of pupils and students at their work, has convinced the writer that there is unquestionable progress at this time, only it is of such a nature that it cannot be measured and so does not reveal itself in the curve. What is going on during these periods of apparent arrest is important in the psychology of learning and an eminently practical question for education. The cue for the interpretation seems to be given by the periods that are dominated by the feeling of mental confusion. These, in general, correspond to the plateaus of the curve. New factors in the study accumulate too rapidly for immediate assimilation. Until they have become reasonably automatic, visible progress is impossible. On the twenty-first day, for example, just at the beginning of the long plateau, the subject wrote, "a more or less ill defined mass seems to be settling down upon me. It looks as though time were needed for this turgid fluid to settle." It is a mistake, though, to assume that the learner is making no progress during this time. He is getting knowledge and it is gradually assuming a more orderly arrangement; but it cannot affect the curve, except at irregular intervals, until it has acquired a certain effective force. The leap forward indicates that the automatization has improved and the power needed for further advance has been gained. Sometimes this becomes evident to the

learner before the advance is made, as on the forty-seventh day, at the end of the long plateau of which we have been speaking, when the subject wrote, "I have a feeling that my score will jump soon."

Closely connected with the fact that the automatization of so-called "higher-order" habits is contemporaneous with that of the "lower-order" is the observation that the progress of an automatization once started is not continuous. The mind grows by sections. It has long been known that in children interests follow one another because of the difference in the time of the attainment of functional maturity by the several parts of the brain. Probably this is only one phase of the more extensive principle that the acquisition of power is always by sections. The underlying reason is physiological. Where it is not a matter of actual brain growth it is one of structural organization, — the opening of new paths of nervous discharge and their habituation to automatic functioning. In the investigation of typewriting[1] this irregularity was observed in the growth of word associations and of position associations (location of the keys by muscular sense), and in this investigation it was seen in the variation of the power to recognize words without pronouncing them, in the ability to visualize words, and in the knowledge of different classes of words. At times the subject seemed to make no progress in one automatization, while in another he advanced by strides.

As in single automatizations, so also in the general forward movement, progress is never steady, but always by leaps preceded by longer or shorter periods of apparent cessation of progress. There is a gradual but irregular growth in the intelligibility of the subject-matter in hand, while interspersed within the period of general advance

[1] *Loc. cit.*

are days when uncertainty and confusion dominate. When in the latter condition the learner feels that the whole thing is hopeless. A few sentences taken from the notes of successive days will illustrate this. On the sixteenth day the subject wrote, "The language seems to have taken on somewhat more intelligibility;" but the following day he "did not experience the same ease as was felt yesterday." The next day "things went quite easily," and this same feeling of ease continued through the nineteenth day; on the twentieth, however, "the difficulties were numerous," and the following day saw no improvement. It will be noticed by referring to the curve that this is about the beginning of the long plateau, and the notes, in each instance written immediately after the test to which they refer, also indicate a period of apparent arrest of progress. On the twenty-second day, the next in order, this becomes still more evident. The notes now run: "Words and forms have been accumulating so rapidly lately that the feeling of confusion that seemed to be disappearing a few days ago has returned. It is the old chaotic feeling that characterized the early part of the work. Still, it is not quite so overwhelming as it was at that time." Again, on the following day, "everything is chaotic." By the twenty-seventh day, however, "the confusion is less apparent. The elements of the language are taking on a little order." But the change was only temporary, as the notes do not indicate any permanence in the improvement until the forty-second day, when "things seemed to go pretty well." From this time the notes give evidence of an increasing feeling of certainty, as on the fifty-third day, when, as the notes say, "the difficulties are becoming somewhat differentiated and less confusing," and on the sixty-fourth, when "the translating begins to seem a little more natural."

In the experiments on ball-tossing[1] and on shorthand writing,[2] and typewriting,[3] monotony was found to be an important factor in the rapidity with which skill was acquired, and the same condition was observed in this work. Periods of monotony alternated with periods of pleasure in the work, and, at times, of keen enthusiasm. While, as has been said, it is not probable that the depression associated with the monotony caused the plateaus, it seems quite reasonable that it prolonged them. Generally, though not always, this feeling of discouragement corresponded with the plateaus of the curve, and it is an interesting fact that returning pleasure and confidence sometimes prophesied a new advance. On the forty-seventh day, for example, the subject felt that his score would "jump soon."

The importance of the time element was very apparent. The accumulation of details of the subject-matter brings frequent periods when a certain length of time is needed for difficulties to adjust themselves, and until this mental organization is completed the facts are not readily usable. It is probable that no amount of work would make progress continuous. Up to a certain point increased effort during periods of arrest may shorten the delay, but effort to the point of mental strain at such a time is of more than doubtful wisdom. The mind does its share toward mental clarification if the material is put clearly before it, but time is always needed if the organization is to be the best of which the mind is capable, or if the resulting acquisition is to be permanent. In the study of typewriting this question was experimentally tested, and it was found that effort to "spurt" did not bring the desired result. Indeed, the exertion seemed rather to interfere with the automatization of associations and movements.

[1] *Loc. cit.* [2] *Loc. cit.* [3] *Loc. cit.*

Time is needed, and time the mind will take. Overstrain and hurry tend to mental confusion rather than to clarification.

Equal amounts of work do not produce equivalent results. This fact was continually forced upon the subject. At times, when the study seemed unusually successful and the subject felt that the following test must markedly raise the score, the result would fall far below what had been accomplished at other times. To account for this solely by a difference in the difficulties of the test exercises does not satisfy the conditions. Difficulties are always relative, and become wholly negligible in the presence of mental organization that comprehends the situation. We have here one phase of the time element involved in learning.

The real advance in the early stages of learning is made during the periods of seeming arrest of progress. The manifest advance, that which is revealed by the curve or by examination marks, which is the same thing, is discouragingly brief. By far the greater part of the learning period is spent on plateaus when both teacher and pupil, failing to understand the situation, feel that they are marking time. Yet it is during these days of retardation that the valuable and solid acquisitions are being made. Americans who spend several years in Germany pass through a long period of discouragement. Though they study the language faithfully, and avail themselves of every opportunity to practice conversation, they seem to make absolutely no progress. The length of this plateau-period varies with different persons, but all experience its oppressiveness. Now the most curious feature of this plateau, aside from its overpowering monotony, is the suddenness with which it finally disappears. Several have told the writer that they went to sleep one night unable to understand anything, as it seemed to them, and utterly

discouraged, and awoke the following morning to find that they had mastered the language, that they could understand practically everything that was said to them. The word associations and national peculiarities of thought sequence had been automatized during the long period when no visible progress was being made. The daily study counted for so little in comparison with the mass of possible words and idioms that the partial acquisitions made from time to time could not assert themselves. Before this was possible it was necessary that the accumulation be great enough to give them effective force. The process by which these acquisitions were automatized was largely subconscious. Time, with patient, steady work, seems to be what is needed, and little immediate manifest effect should be expected. Plateaus in learning represent, among other things, the mind's revolt against further crowding and cramming.

Summary of results and general inferences.—1. The learning process is one of great irregularity. Days of advance are followed by periods of retardation and by single days of exceptionally low scores. But suddenly, and at times without previous premonition, the learner leaps forward. The new position, however, is frequently beyond his present permanent ability, and, in that case, he falls back, but if so it is only for a short time, as the sudden advance presages a general forward movement. Physical condition, though always a factor in learning, cannot account for the variation. It is one of the characteristics of the learning process.

2. There are not one or two periods of retardation when the "lower-order" habits are being automatized in preparation for the "higher-order." Instead of this there are many, and they are essential factors in the learning

process, though the number probably varies somewhat with the nature of the subject studied, as well as with the rapidity with which ground is covered, and, in the case of school children, with the quality of the instruction given. Both simple and complex factors — "lower" and "higher order" habits — are present almost from the start, but in different degrees, the "lower order" predominating at the start, and the "higher" gradually assuming more importance. The learner thus gradually passes from a stage of necessary, exact attention to the mechanical elements of the subject to a condition in which reaction to these elements is automatic, and the mind is able to deal with them in groups as symbols of ideas.

3. The learning process is a gradual and irregular growth from a condition of mental uncertainty and confusion to one of automatic certainty.

4. Examinations given during periods of retardation — the plateaus of the curve — do not in any way show the progress of the learner. For this reason tests of proficiency should always be given at a time when the pupils have been showing special proficiency for a few days, when they are well along in the upward movement of the curve. Since the progress of different children does not coincide from day to day, the disadvantage of class examinations is obvious.

5. Monotony is always a factor in learning. It expresses the inability of the mind to continue interested in the same thing. The periods when the mind is trying to bring the confusing details of the subject-matter into intelligible order — the plateaus of the curve — tend to prolong the monotony, and it in turn probably increases the length of time of the arrest of progress.

6. Time is needed for the mental content to become organized. In beginning a new subject details accumulate

much faster than they can be assimilated. Failure to recognize this in the early part of the work brings increased confusion later and overwhelms the learner with irresistible discouragement. Reviews by means of new material and explanatory reorganization of the subject-matter are important here, but of no less moment are the material and method of the review. It must not be forgotten that this is also the period of monotony.

7. The periods of real growth in the acquisition of knowledge are those of apparent arrest of progress, — the plateaus of the curve, — and it is during these days that the teacher is tested.

8. A large part of this growth is undoubtedly subconscious, but the efficiency of subconscious processes depends largely on the manner in which the details and conditions of the subject-matter are presented to the mind of the learner by the teacher and by his own conscious efforts.

XI

AN APPEAL FROM THE PREVAILING DOCTRINE OF A DETACHED SUBCONSCIOUSNESS

Arthur Henry Pierce

The doctrine that our conscious life is only partly upon the surface, that regions of it, of unspecified extent, lie somehow tucked away out of sight and immediate ken, has spread with astonishing rapidity since its vigorous promulgation about a quarter of a century ago. Just what the status of this doctrine is among professed psychologists it is hard to say. But despite the eminence of those who avowedly stand as its champions, I suspect that they have failed to carry the majority of psychologists with them. It is rather in other circles, it seems to me, that the doctrine has obtained a vogue. Those who have only a dilettante interest in matters psychological and are content with a certain respectable shallowness of thought have generally given the doctrine a hearty welcome, since it serves them in explaining so much in their experience that they have noted and found obscure.

It was Hudson's "Law of Psychic Phenomena" that some years ago caught the lay readers of this country and gave them the vague phrase "subjective mind" for the easy solution of hitherto baffling perplexities. And now more recently the suggestion made in James's "Varieties of Religious Experience," that "the subconscious may be the mediating link between the human and the divine," has made the doctrine respectable and sig-

nificant to the clergy, and to many readers of high intelligence who are not trained for the critical examination of this sort of material. There has thus arisen a rhetorical term which, both in conversation and in fine writing, serves a ready and not too accurate purpose in a vast variety of situations.

Especially deeply has this view rooted itself in minds leaning toward the occult, the happy blending of what is genuinely vague and mysterious with what is seemingly cast in a mould of scientific rigidity being well-nigh ideal for the enthralling of that type of mind. Accordingly the subconscious looms large in the spoken and written language of the modern healing cults. For the mental healers, under whatever specific designation they may appear, the subconscious is one of the fundamental verities. It seems to be at once the source of all troubles and the source of all power. If fearful, it can produce dire ills; if fearless, it conduces to all that is good. Its powers range from the creation and destruction of disease germs to the telepathic control of the thoughts of others.

The lay mind seems no less certain of the existence of a subconsciousness, though naturally enough it assigns less definite functions to it. In popular usage the subconscious refers ordinarily to a rather vaguely conceived repository of past experiences, and appeal is made to it mostly in cases where a word or fact cannot be recalled, or where it is held responsible for some bit of conduct which lacks the full sanction of conscious reflection.

The most precise and extended formulations of the doctrine have been made in connection with certain phases of mental pathology and in connection with those discussions which belong properly to the domain of Psychical Research. In the latter case the term "subliminal" is more often employed, — a term which in Myers's hands

is given a metaphysical connotation that will not concern us here.

A doctrine of such wide adoption and such rapid promulgation; a doctrine that by its very nature is exposed to a vast array of misinterpretations and abuses; a doctrine that is at once warmly welcomed by charlatans and the unscientific, adopted as good working hypothesis or even as proved fact by scientists of eminence, while rejected or totally ignored by others of like eminence; — such a doctrine it is certainly not out of place to subject to as rigid an examination as may be. To fulfill at least the spirit of such an examination is the purpose of this paper. First, then, we shall try to be clear about the meaning of the doctrine, in so far as this meaning has been defined, and then we shall endeavor to submit to a critical examination the evidence that the supporters of the doctrine have been wont to adduce.

I. THE MEANING OF THE DOCTRINE

The term "subconsciousness" has three quite distinct meanings. First, it may refer to the non-focal portion of any moment of actual consciousness, that portion which, to avoid confusion, is now almost universally called "marginal." In this matter all are agreed. All admit a region of diminished attention, where processes are in a state of reduced vividness and where associative activities are at a minimum. About the existence of this variety of subconsciousness there need be no discussion.

The second meaning attached to subconsciousness may be conveniently called that of Leibniz. Here the term is meant to cover the indefinitely diminishing grades of consciousness in which all the items of our past experience are still permanently existing. No conscious processes once experienced are ever lost. They have simply

sunk to grades of low intensity, awaiting some favorable conditions which shall bring them again to the full light of focal consciousness. On this view the entire field of consciousness is intact. There are no breaks or gaps. And the main feature of the doctrine lies in the thought that a being who could catch a glimpse of any person's total consciousness would be aware of a bright and vivid centre, shading off from which, out to dim boundaries limited only by the individual's life experiences, would lie the still living but subdued mental processes.

The third meaning is the one we have set out to examine. This type of subconsciousness differentiates itself from that just mentioned in two important particulars. First, the outlying processes are more or less sharply sundered from the primary consciousness and aggregated into groups of their own; and secondly, such processes are not in a state of psychic inertness, but may attain high grades of intensity and display extraordinary activity. Here, too, the metaphor is for the most part changed. Consciousness is less often conceived pictorially as a field, but rather as something possessing levels or strata. To be *sub*conscious is not to be *less* conscious, but to be *in a lower stratum* of consciousness. This lower consciousness is not necessarily inferior in vividness or in diversity, only it has the misfortune to be separated from the normal upper consciousness and to be living a life of its own. The metaphors of language have been well-nigh exhausted in the attempt to characterize fitly this adjunct of our conscious life. It is referred to as "submerged," "subliminal," "secondary," or, with a change of figure, as "split-off," or "extra-marginal." Often it is personified, and we read of the "subconscious self." And one writer, adopting the expression "sub-waking self," claims that "the life of the waking self-consciousness flows within

the larger life of the sub-waking self like a warm equatorial current within the cold bosom of the ocean." But through all this diversity of names runs the one essential thought, that each individual gives shelter to at least a pair of consciousnesses, to the lower of which he is commonly allowed no access.

This detached and submerged consciousness appears in our dreams and in the hypnotic trance. From it come the visions seen in the crystal, and to it are directed the wholesome suggestions of the healer. It is personified because (under pressure) it assumes a name. It seems to possess what for the normal consciousness are long forgotten experiences, and thus is likened to "a great covered reservoir in which is stored the total aggregation of past mental states and activities." But it is not in a state of inert quiescence that these vestiges of experience remain. This subconsciousness is not a mere place of safe keeping for what may be subsequently desired. No, there is much activity, and activity of all grades of worth. The subconscious may be fostering delusions or fixed ideas which from time to time are to pester the normal self. Or, at the other end of the scale of values, these hidden processes may undergo elaborations of the most delicate and marvelous sort, until finally they attain a psychic tension which causes them to burst the barriers and emerge into the upper consciousness under the form of inspirations of genius. Believers in this doctrine are not accustomed to think of the various levels as separated by impassable walls. There may lie between them the "filmiest of screens," and, as just hinted, many an experience is but an irruption from the depths below. Moreover the upper and lower levels may, by proper manipulation, be made to coalesce, so that the hidden processes become revealed.

Such, in fine, is the doctrine of subconsciousness with

which we are here concerned. As we turn to the evidence which is appealed to in its support, we shall see still further characteristics and modes of behavior which this subconsciousness is supposed to display.[1]

II. THE EVIDENCE ADDUCED

So diverse are the sources of the evidence and so varied the experiences cited in support of this theory that only the briefest sketch of them is possible within the limits of this paper. The bulk of the evidence is drawn on the one hand from certain pathological experiences, and on the other from those normal experiences which are ordinarily regarded as unusual.

a. Pathological. — It seems to have been the shifting and contradictory phenomena presented by hysterical patients which first suggested the operations of a coexisting but submerged consciousness. The writings of Janet and Binet on this subject are largely filled with these matters. The anæsthesias, the amnesias, the aboulias, and all the other bizarre and surprising manifestations of hystericals, are not in any sense, it is said, genuine phenomena. They are not what they seem. The sensations, memories, and what not, while denied to the every-day self, are, we are told, gathered together in a submerged consciousness. As an indication that the disabilities mentioned above are essentially unreal, it is pointed out that

[1] The principal sources where this doctrine may be studied are here collected: Binet, *Alterations of Personality*; Janet, *L'Automatisme Psychologique*; *État Mental des Hystériques*; James, "The Hidden Self," *Scribner's Magazine*, 1890; *Varieties of Religious Experience*, pp. 233–236, 388, 483, 511; Myers, *Human Personality*, especially ch. i, iii, vi, viii; Sidis, *Psychology of Suggestion*; *Multiple Personality*; *Psychopathological Researches in Mental Dissociation*. For views adverse to the doctrine see Delabarre, in *The Progress of the World*, 1895, pp. 21–26; Jastrow, *American Journal of Psychology*, vol. xiv, p. 79; Pierce, Proceedings of the Society for Psychical Research, July, 1895.

various devices may be employed for "tapping" the subconscious strata, whereupon the seemingly lost processes proceed to make themselves known. Distract the attention of the patient by engaging her in an animated conversation, and the anæsthetic hand, in response to whispered questions or commands, will reveal by automatic writing or otherwise the possessions of the hidden consciousness. Thus Madame D., who cannot recall the name of the hospital interne, will automatically write it without difficulty. Or, by means of signs agreed upon, the anæsthetic hand will "converse" with the whispering investigator, giving evidence that its sensations are somewhere intact and that memories lost to the normal self are still existent. Frequently, too, these lower levels of consciousness are reached by hypnosis, and then are laid bare the morbid memories and emotions, unremembered remnants of past happenings, which like pestering parasites harass and torment the upper consciousness and give rise to many of the latter's otherwise inexplicable woes.

Curious instances of intercommunication and coöperation of the two levels of consciousness are pointed out. Tell the patient to think of a name, and the concealed anæsthetic hand will be seen to write it. Prick the anæsthetic hand three times, and the subject, if questioned, will report that she is thinking of the number three. Thus, as Binet puts it, the one consciousness whispers its experience to the other. There is also frequently, as in the last case cited, a "transmutation of the subconscious message" in such wise that though the impression of the secondary consciousness be tactual, the primary level receives it in the form of visual, articulatory, or other imagery.

Another region of the pathological has been exploited by Sidis. Amnesias consequent upon accident or accompanying disorders other than hysterical are, it is claimed,

by no means absolute. The secondary consciousness still contains them. The interesting case of Thomas Hanna is an excellent illustration of this claim.[1] The submerged memories, we are told, were "raised" either during the occurrence of ordinary dreaming or by a method known as "hypnoidization." This method consists simply in getting the individual into a state of concentrated calm whereupon, with eyes closed and perhaps with the hand of the physician laid upon his forehead, he is asked to describe the scenes that pass before his mind. "In the case of our patient," writes Dr. Sidis, "the hypnoidization brought forth phenomena of the utmost interest and value. Events, names of persons, of places, sentences, phrases, whole paragraphs of books totally lapsed from memory, and in languages the very words of which sounded bizarre to his ears and the meaning of which was to him inscrutable — all that flashed lightning-like on the patient's mind. So successful was this method, that on one occasion the patient was frightened by the flood of memories that rose suddenly from the obscure subconscious regions, deluged his mind, and were expressed aloud, only to be forgotten the next moment. To the patient himself it appeared as if another being took possession of his tongue." So, too, many of Mr. Hanna's dreams vividly recalled the striking events immediately preceding his accident, though the upper consciousness could not distinguish them from pure creatures of fancy.

b. Unusual normal experiences. — But we are not compelled to go to the pathological for all our evidence. When once we know how and where to look for it, many an experience, we are told, can reveal to us the hidden resources of our minds. To such experiences belong particularly the facts of normal automatic writing, by which

[1] See the interesting account of this case in Sidis's *Multiple Personality*.

long-forgotten literary passages are reproduced while the conscious self is unaware of what is being written; the facts of crystal vision, by which lapsed memories of addresses, names, or scraps of verse are restored, or images aroused of rooms or corners of landscape which, though having come within the field of vision, have never been consciously perceived; and all those phenomena peculiar to the genius, of whatever type, in his moments of productive activity. Our dreams also are frequently revealers of the subconscious, if indeed the dream-consciousness is not largely identical with subconsciousness.

The evidence from the phenomena of genius is the most striking in its dramatic quality. It is Myers who has most powerfully called attention to this. To realize the force of the argument one has only to recall the almost universal testimony of gifted poets, musicians, playwrights, and orators to the effect that their material often comes to them "with all the surprise of novelty and of extraneous origin." They are *invaded* by their brilliant intuitions, their unexpected insights, their flashes of inspiration. For all these their conscious self feels no personal responsibility. The creative genius, whether as a poet "singing hymns unbidden," or as a statesman evolving a policy, stands as spectator and listener over against the "subliminal uprushes" into his normal consciousness, as De Musset, Saint-Saens, and many another lesser genius has abundantly testified. How, then, we are asked, can we avoid acknowledging a subconscious region where incubations and elaborations proceed without coöperation on our part, and where, as James puts it, we must postulate "subconsciously maturing processes, eventuating in results of which we grow suddenly conscious?"

III. CERTAIN QUESTIONS RAISED

a. Do all writers on the subconscious and all who profess to believe in its existence refer unmistakably to sundered and submerged groups of conscious elements, or do they really mean to speak only of sunderings and segregations that have taken place in the nervous system? — The vocabulary of psychology is often so much more accessible and pliable for descriptive use that writers who have not cared to discriminate too sharply between the physical and the psychical have hopelessly confused the terms of their descriptions. If space allowed, abundant illustrations of this confusion could be given. With the actuality of such confusion in mind, I cannot help thinking, with a good deal of conviction, that some of those who have arrived at the doctrine of the subconscious through the medium of mental pathology are really meaning by the term to refer to the functioning of neurones and neurone groups, the real structures with which, as pathologists, they are primarily and fundamentally concerned. Meanwhile, however, the psychological terminology is more convenient for their descriptive purposes, and before they are fully aware of their situation they have plunged themselves into a phraseology which must be taken by the reader to refer to genuine psychological realities. But these doubtful cases aside, a large residuum of writers is left who, if language is ever to be trusted, refer indubitably to a splitting up of consciousness itself.

b. Is the subconscious supposed to have a cerebral basis? — It seems quite absurd to raise this question, yet it is worth while to be clear upon the point, since freedom from cerebral constraint seems so often to be implied. I think we may unhesitatingly give an affirmative reply to this question. Myers speaks of a "cerebration beneath

the ordinary threshold of consciousness." James utters the opinion that "organized systems of paths [brain paths] can be thrown out of gear with others, so that the processes in one system give rise to one consciousness, and those of another system to another *simultaneously* existing consciousness." And Sidis speaks of the dissociation which causes subconscious phenomena as *psychophysical*, as a "dissociation and disaggregation of systems of central neural elements with their concomitant psychic systems." These may be taken as distinct admissions that the same parallelistic relations are supposed to hold in respect to the subconscious as in the case of normal consciousness. The force of this admission we shall see later.

c. *Does the term "subconsciousness" refer to an hypothesis submitted for the explanation and interpretation of certain observed facts, or does it stand for a demonstrable and already demonstrated reality?* — In their better moments the chief expounders of the subconscious speak of the *hypothesis* which they are upholding,[1] admitting freely that it is an inference from the facts observed. But their better moments are not lasting, and forthwith they forget — for the most part — that they should be engaged in the perpetual testing of this supposition; they fall into speaking of it as a demonstrated reality to be appealed to as an unquestioned means of further explanation. Thus James[2] writes of the subconscious as "a recognized psychological fact," as a "nowadays well-accredited psychological entity." And on the part of the uncritical accepters of this doctrine there is not the shadow of a doubt that this subconsciousness of which they hear and read is as little to be questioned

[1] See, for example, Myers, *Human Personality*, vol. i, pp. 15, 16; Janet, *État Mental*, vol. i, pp. 44, 45; Sidis, *Psychopathological Researches*, p. 21.

[2] *Varieties of Religious Experience*, pp. 511, 512.

as their momentary mental life testified to by direct introspection.

IV. THE EVIDENCE EXAMINED

There are certain commonplace requirements imposed by the logic of science upon one who seeks to interpret and explain, which seem to have been overlooked with a singular facility by those who espouse the subconscious. One of these requirements — so obvious that one hardly dares bring against another the reproach of neglecting it — is that a new hypothesis is to be erected only after every struggle to include the new facts within the circuit of the old has proved ineffectual. To multiply hypotheses when fewer are equal to the task of furnishing a comprehensive understanding of the facts is certainly to run counter to the canons of scientific method. Now the advocates of a detached consciousness have been singularly heedless of these demands. They have made no adequate endeavor to understand their facts in the light of the legitimate marginal consciousness on the one hand or of pure physiological processes on the other, but have launched themselves with unscientific temerity upon the sea of a new hypothesis.

It will conduce to a clear understanding of our discussion of the various facts that have been sketched above, if at the outset we can agree upon a few guiding principles. I shall adopt the following: —

1. *Inference and observed fact must be relentlessly discriminated.* — This is a simple and fundamental logical principle, but failure to pay it the slightest heed is one of the most conspicuous traits of several of the voluminous writers on the subconscious.

2. *Of two or more possible explanations for a given fact or set of facts the simplest is always to be chosen.* —

It seems sometimes to be forgotten that the law of parsimony holds in psychology as well as in the natural sciences.

3. *If aid in explanation is to be sought through analogy, it is analogy with the simple, normal, well-established, or already accepted that is always to be given preference over that with the complex and exceptional.*

Let no one sneer at the insistence laid here upon these elementary and, to some, ultra-obvious principles, before convincing himself of the scandalous frequency with which their infraction is to be found in certain writers on the subconscious. The snares that beset the imaginative writer in this field are almost precisely those that entrap the present-day littérateurs who concern themselves with animal life and mentality. Here, as there, in place of the simple observed fact, distinct from its suggested interpretation, we are given directly and as if it were the lowest terms of the matter what the writer himself has poetized into the facts. Here, as there, when explanation is needed, it is not the most simple and straightforward but the most dramatic explanation that is proposed. And finally here, as there, analogy runs such unbridled riot that the distinction between its products and those of genuine proof become blurred and forgotten.

With these preliminaries let us come to a serious examination of the alleged facts.

a. Automatic writing.

So far as I am aware, no one has ever found it necessary to posit a secondary consciousness to explain such uncontrollable tremblings and twitchings of the body as occur occasionally in all of us and most markedly in such nervous troubles as chorea, locomotor ataxia, and general

paralysis. If, now, a detached guiding consciousness is posited in the case of automatic writing, it must be because the movements of the hand display a *coherent series* of coördinated movements. The usual conscious control-series being wanting, and such a control-series being supposed essential, a sundered consciousness is assumed to contain it. This seems to be the argument. And the question is, simply, whether we need to assume a guiding consciousness, or may explain the matter in cerebral terms alone.

Certain of the well-known facts of automatic writing are persistently slurred over by the majority of writers when they come to the matter of explanation. Such facts are these: The hand will frequently write backwards; or it will write mirror script; or, if a certain motion — e. g. a circular one — be imposed upon it by the investigator, this motion will be repeated indefinitely; sometimes, too, letters are misplaced so that puzzling anagrams appear to have been written, as in the "Clelia case" of the Society for Psychical Research. Surely such occurrences point clearly enough to a disordered neural mechanism rather than to a perverse or humorously inclined secondary consciousness, an assumption too absurd for serious consideration. And we are certainly more obedient to the behests of scientific method when we classify the imperfections of automatic writing with the deranged movements of nervous disease and find their cause in similar fashion. But if this is so, how shall we proceed? Shall we employ two varieties of explanation? Shall we say that the coherent and apparently communicative sentences of the automatically moving hand are to be understood by referring them to a bit of consciousness that has floated off from the main stream, while the slips and irregularities and incoherences are due to neural derangements? Shall we not be

more consistent, and thus more rational, when we take these more successful performances to indicate to us an underlying neural mechanism so highly organized by past experience that under appropriate circumstances it may work without guidance? The writing mechanism is so highly and delicately developed in us writing mortals that it is small wonder that it may operate independently when, for one cause or another, its system of neural connections has become severed from that other system which for the moment is subserving consciousness. On the other hand, if we adopt the hypothesis of a secondary consciousness and consistently apply it, we must suppose it to superintend much that we ordinarily place in the sphere of habit. How, for example, do we unerringly compound the strokes of a rapidly written word such as "immunity"? Is a consciousness standing over the writing mechanism, counting the strokes with rounded summits that belong to the *m*'s and *n*'s and the strokes with pointed summits that belong to the *i*'s and *u*'s? I, for one, can get full satisfaction in the belief that when my personal consciousness is not supervising my bodily movements, they are not being consciously supervised at all.

This cerebral interpretation finds a measure of substantiation in the fact that automatic movements may be acquired by persons not otherwise presenting them, provided that the effort at acquisition be sufficiently persistent. This was demonstrated some years ago by Solomons and Stein.[1] The attention being engrossed by interesting reading, they gradually acquired the power to write automatically, both when the initial movement was impressed upon the hand by the operator and when the words to be written were dictated. To be sure, a sustained automatism was not secured in these experiments, for after the sub-

[1] "Normal Motor Automatism," *Psychological Review*, vol. iii, 1896, p. 492.

jects obtained periods of unconsciousness of movements extending over five or six words, the attempt at further education in this direction was dropped. It is noteworthy that when the period of unconsciousness was broken by a flash of consciousness, the movements of the arm seemed "extra personal," now cognized but not guided. To interpret these experiences as due to a more or less complete segregation of the neural writing system seems vastly simpler and more satisfactory than to conjecture that certain conscious processes have also simultaneously cut themselves adrift and organized themselves into a control-series. The former is the view of the experimenters themselves, who express the opinion that we are prone to set too low an estimate upon our powers of genuinely automatic behavior.

A few objections to this physiological interpretation must be met. Binet found that when the hysteric's anæsthetic hand was made to write a word with an erroneous spelling, the hand, in repeating the impressed movement, would hesitate at the point where the wrong letter had been inserted, seem to ponder a moment, and then write the word correctly. But such action may be interpreted either as due to competition between nervous impulses, the one started by the operator, the other due to the habitual sequence of the subject's movements in this particular, or we may suppose that at the instant of correction there was a real flash of consciousness, which set things straight and immediately lapsed. Such flashes as this latter are certainly not to be denied to the shifting and unstable consciousness of the hysteric. A more serious objection to this view could be raised if the automatic writing should at any time reveal knowledge not possessed by the writer and not in any way due to the suggestions of the operator. That such knowledge is ever

expressed there seems to the present writer to be no unequivocal testimony. And were such knowledge expressed, its explanation would require a far more complicated hypothesis than that which we have here under review.

b. Simple communications. — Crystal vision. — Conflicting levels.

1. When the crystal gazer sees visions either of forgotten experiences or of objects and scenes that have never been consciously perceived, though they have fallen within the range of his vision, we are said to have evidence that the lower levels of consciousness are communicating with the upper level. For must not the forgotten experience have been retained in the subconscious, and in the case of the unrecognized scene, in addition to its retention by the subsconscious, must it not also have been first noted by it? Under the influence of the crystal, then, we are to believe, the subconsciousness yields up its treasures and passes them over to the primary consciousness. But now I submit, is not the coöperation of the subconsciousness here a quite gratuitous assumption? Suppose the forgotten name or address or line of poetry *is* seen in the crystal. Are we obliged to describe these acts of recall as "recrudescent memories, rising thus and thus only from the subconscious strata to which they had sunk"?[1] What is it, exactly, "to sink to a subconscious stratum"? And after something has sunk there, how is it to be retained? Are processes in subconsciousness supposed to be abiding and permanent affairs? Is the evanescent and fleeting character of processes something that holds only in the normal level? No, if we are to think consistently, we must admit that subconscious processes — granting for the moment

[1] *Proceedings of the Society for Psychical Research*, vol. v, p. 505.

their existence — are as little endowed with permanence as any process in either the mental or the physical world. The subconscious process, as well as any other, must fade and vanish and be represented in its absence by its concomitant cerebral disposition. But if this is so, why need we assume that the renewed excitation of this disposition — accomplished, it would seem, through the stimulating effect of the crystal vision — conditions first of all the revival of a subconscious process which then, in some fashion not to be definitely stated, is conveyed to the superior level of consciousness? To a straightforward and uninfected thinker on these matters it would seem that since the cerebral dispositions in question can be aroused through fully conscious activities, — those, namely, of fixed and expectant gazing, — the conscious process corresponding to this arousal could be supposed to appear directly in the normal consciousness without the dramatic and essentially inexplicable mediation of a secondary consciousness, which for some cause or other proceeds to deliver it over to a higher level. The advocate of subconsciousness must here put forward an hypothesis more complex than his facts can demand or warrant.

Essentially the same comment is to be made on those other cases where the crystal vision reveals unrecognized scenes and the like. If the jessamine-covered wall appearing in the crystal[1] turns out to be located at the spot where on the previous day an absorbing conversation was being carried on, must we suppose that a hyperæsthetic subconsciousness took note of the same and stored up the vision, or is it sufficient to say that the visual impressions were marginally received, their appropriate dispositions being revived on the following day by the exercise of concentration upon the crystal? It is the latter again that

[1] *Proceedings of the Society for Psychical Research*, vol. v, pp. 506–507.

seems the more simple mode of interpretation, and as such, if it satisfies the case, we are bound to adopt it. It is to be noted, too, that this mode of regarding the matter enables us to establish a continuity with certain quite normal occurrences. For unnoticed impressions may appear in the form of after-images, or as hypnagogic visions, or as well-defined dream imagery. And it is certainly labored in these cases to interpolate a secondary consciousness between the physiological reception of the impression and the appearance of a conscious process corresponding to it. The alternative hypothesis would substitute for the dim apprehension of an experience by the marginal region of consciousness a supposedly vivid and clear apprehension of the experience by a detached and coworking consciousness, which while the primary consciousness is occupied can itself be concerned with what the primary consciousness fails to notice. It must be left to the reader to decide which is the more adequate hypothesis. It may, however, be remarked that it is difficult to conceive how the same sense organ may be thus used in the interests of two separate consciousnesses, and how, further, each consciousness sorts out what shall be its peculiar property.

Other cases of communication similar to those mentioned on page 321, where the initial experience is "transmuted" in the course of its transference from one level to the other, reveal, I believe, nothing new in principle beyond what has been discussed above. In another connection [1] I have tried to show that all these phenomena are quite analogous to normal happenings, and I must content myself here with referring any interested reader to the discussions indicated in the footnote.

2. The advocates of a secondary consciousness have

[1] *Journal of Philosophy, Psychology, and Scientific Methods*, vol. i, 1904, p. 400 ; vol. ii, 1905, p. 293.

made much of what they have alleged to be phenomena of *conflict* between the two levels. The lower stratum is supposed to harbor within its depths remembrances of former dreads, anxieties, frights, or other disagreeable happenings, and by means of these to torment and bother the upper consciousness. The subconsciousness has now become parasitic. The experiences of Janet's subject Marie, together with the removals by successive hypnotizations of the pestering memories that caused all her troubles, have been graphically told by James.[1] The main clinical desideratum in these parasitic cases is, we are told, to get the morbid memories somehow into full consciousness, where they may be looked squarely in the face, yes, even cursed and sworn at in fits of weeping, whereupon they usually disappear.

But how, pray, may one layer of consciousness affect another in the manner alleged? To suppose a lower level to pass up ideas and images — as in crystal vision — is difficult enough to conceive, but at least it is true that in such cases definite ideas and images are found in the upper consciousness which seem to have come from somewhere. But what is *here* passed up? Apparently nothing is really delivered over except some indefinite sort of influence, the particular direction in which this will proceed to develop being quite unpredictable. But *how* one level may thus exert a baneful influence upon another, we are not informed. And indeed we have no analogy to guide us in trying to construct an hypothesis as to how two sundered consciousnesses may jostle each other and come into hostile collision without at the moment coalescing in part and thus, to that extent, becoming one consciousness.

To be sure, hypnosis is said to reveal the tormenting memory. But even though the hypnotic and the secondary

[1] "The Hidden Self," *Scribner's Magazine*, 1890.

consciousness be identical, this discovery cannot be made to mean that this memory had been perpetually present in the submerged level. All that we can properly affirm is that the cerebral conditions of this memory were still existent. And we seem to be remaining much more within the region of verifiable and comprehensible realities when we attribute the "parasitic torment," not to a hypothetical and necessarily transitory memory, which in inexplicable fashion is feeding upon a consciousness other than that which contains it, but rather to a permanent centre or region of cortical irritation, due to previous nervous shock, which may indeed extend its influence to adjacent cortical regions. This latter is vague enough, to be sure. But certainly we know something about neural inhibitions and other cortical influences, whereas we know nothing about the possibility or manner of interplay between discordant and pestering consciousnesses.

Here, as elsewhere in the argument, it will be seen that we are pleading for continuity with the usual and for analogy with the simplest counterpart in normal experience. And in these parasitic cases we seem to have only exaggerations, implanted upon an unstable and diseased nervous system, of those normal experiences which we know as states of depression, due confessedly to fatigue or to some other more grave but still temporary disorder of the nervous system.

I cannot leave this topic without a word in reference to a dramatic variety of plaguing and joke-playing which one consciousness is alleged to perpetrate upon the other. Janet's Léonie 2 outwits Léonie 1 by placing letters, which Léonie 1 would otherwise have destroyed, in an album beside a picture which said Léonie 1 disliked and avoided. Sally Beauchamp, the complex and elusive subject of Dr. Morton Prince, affords the best example of this variety of

teasing which the literature of the topic contains.[1] B III, herself lacking timidity and aware of the qualms of B I, teases the latter by bringing in snakes and spiders for her undoing when she shall awake and become the dominant consciousness. But I fail to see in these cases anything more than a morbid extension of those changes which we all normally experience within our own personalities when we pass from moments of expanded vision and volitional power to those contracted and detested states which we feel to be but wretched representatives of our real selves. The richer state deplores, if it does not actually hate, the anæmic other self whose presence it foresees. If this dramatic sundering is accomplished with a sufficiently lively fancy, the "teasing" is but a short step in the development of the plot. In some favorable and commanding moment one abjures coffee, though knowing that deplorable results will temporarily follow. "Let that weakly indulgent self suffer and learn its weakness," is the high and mighty comment of the complacent and dictatorial self of the moment. This, both for the onlooker and for the suffering self, is certainly not without analogy with the morbid case referred to. One has but to assume an exaggeration of the normally contradictory and warring phases of personality, — an assumption amply borne out by the facts, — add a strong dramatic tendency, helped out amazingly in such cases by an earnest desire to give the investigator what he is supposed to expect, and admit the forgetfulness in state I of what prompted the act of state III, whereupon there seems scant ground for supposing that we have a case where one level of personality is assailing another less favored offshoot which enjoys an existence simultaneous with its own.

[1] *The Dissociation of a Personality*, or, *Proceedings of Society for Psychical Research*, 1900, p. 466.

I have dwelt thus at length upon these cases of communication, not because I think this is the stronghold of the position which I am endeavoring to attack, but because they seem to have carried conviction to the minds of many in a way out of all proportion to the warrant of the facts.

c. Communication after subterranean elaboration. — Genius and conversion.

1. *Genius.* — To such a degree is the genius an object of our wondering admiration that we are often prone to place him in a category apart and to seek strange ways of explaining his singularities. We shrink from an explanation that shall too easily dispose of him. In fact, for many minds a decent residuum of the incomprehensible seems best to befit the case. We forget frequently to search for evidence of continuity between the processes of the genius and those of the common herd. The poetic manner of conceiving him is too attractive to permit of such an apparent vilification of him. We like to think of his products as issuing fountain-like and ungrudgingly from some hidden and mysterious source. We like to think him relieved of all the toil and distress of constructive thought, his mind being irresistibly invaded by the finished product cunningly wrought he knows not where. Now as psychological experience this fact of *invasion* is to a great extent true. It is not alone in the awed wonder of others that the doctrine of inspiration has had its source. The genius himself testifies to a large measure of helplessness and irresponsibility. He finds his material ready, and its arrival constitutes the mystery. Where was it wrought, and how? This is one of the problems of genius.

It is this problem of the *arrival* of material and the *mode of its fashioning* which the doctrine of the sub-

conscious seeks to meet. In a word we may say that this doctrine asserts that the genius's material arrives by communication from the subconsciousness, where its incubation and elaboration have been going forward. The novel feature of the situation, beyond the simple communication phenomena of the foregoing section, is then the allegation that subconsciousness achieves the full preparation of the material before it is delivered over to the upper consciousness. It is from this point of view that Myers speaks of genius as "a power of appropriating the results of subliminal mentation to subserve the supraliminal stream of thought; so that an 'inspiration of genius' will be in truth a *subliminal uprush*, an emergence into the current of ideas which the man is consciously manipulating of other ideas which he has not consciously originated, but which have shaped themselves beyond his will, in profounder regions of his being."[1] Though couched in terms of the "subliminal," we may by the substitution of the word "subconscious" allow this statement to stand as an expression of the current opinion about genius held by the believers in the subconscious. And without any further exposition of such views, we may address ourselves to the task of inquiring whether a less mystical way of interpreting the *invasions* and *unbidden uprushes* of the genius may not be devised.

In the interests of continuity of explanation, must we not recognize at once and in full measure that, aside from the products of immediate perception, the entire mass of our material of thought and fancy *arrives* in consciousness often with a certain galling display of insolent independence? As psychologists have repeatedly pointed out, if the mechanism of association declines to work, we are

[1] *Human Personality*, vol. i, p. 71. Cf. Binet, *Année Psychologique*, vol. i, 1894, p. 119 ff.

helpless in the situation, and in respect to this particular psychic material, we remain in want. All ideational material is, as it were, landed in consciousness, as are the passengers of an incoming steamship at their destined wharf. But there are differences to be noted in the arrivals. Some are expected. These are the ideas and images which we well know and which have been summoned for present purposes. But some are unexpected. Their faces are unknown. For a moment they surprise us by the careless ease with which they make themselves at home. These are the sudden insights, the uprushes, the inspirations. And these we must account for. Where did they have their birth?

Let us note immediately that vastly more of our psychic material than we are wont to suppose arrives in consciousness with an alien mien. Our clever retorts; our humorous characterizations; our fresh ways of putting things; the issues to our sentences, coming often with an effectiveness of turn that the beginning could never have foreshadowed; — all these, and infinitely more of our every-day experiences, evidence the abundance of telling activity occurring somewhere outside the confines of consciousness. Something occurs in a region beyond our direct control, and consciousness is supplied with combinations utterly strange to it. We thus see that what we have to explain is not alone the inspirations of genius but the alien arrivals of every sort, the peaceful invaders of every consciousness wherein there is a successful creation, however humble it may be. What, then, is the nature of that process by which new and strange products are fashioned, to emerge later in consciousness?

It is the notion of organized systems of cortical dispositions that must again be summoned to our aid. With this hypothesis we can secure continuity over a large field

of facts. On the one hand we have the incoherent ravings of the maniac, which we explain by the disordered and unstable brain. There is abundance of cerebration here, but little organization. An instance of greater organization is afforded by cases of retinal inflammation,[1] where with perfect helplessness one is treated to moving visions of landscapes, or what not, of unforeseen character and with a mode of development utterly beyond the spectator's control. We have no difficulty, I think, in understanding these and like experiences by appealing to the brain as their cause. But as soon as evidence of still further organization appears, why need we leap to the subliminal for aid? Every experience that we have leaves its trace behind. If our experiences are orderly, these traces must form themselves into groups and systems of organized dispositions. Now the genius never gets his inspirations without special preparation for them. The poet does not suffer uprushes of thought concerned with administrative policy, nor does the military genius find his mind invaded by scientific hypotheses. And this preparation is such that the brain of the genius must be surcharged with the deposits of past perceptions and reflections. And granting the delicate poise and balance of the "high" brain of the genius, can we hesitate to believe that combinations of existing dispositions will work themselves out in unlimited fashion? Yes, particularly in the absence of conscious effort, may it be true that the possibility of these novel combinations is prepared for. For then the emphases are removed and the delicate interplay of neurones that corresponds to associations by similarity — the leading prerogative of the genius — may be preparing. This, I take it, is all that we need mean when we acknowledge, as I think we readily

[1] See Caverno, "Incipient Pseudopia," *Psychological Review*, vol. xi, p. 338.

must, that in the intervals of inactivity, whether of genius or of ordinary mortal, many events of importance are passing, the outcome of which will be registered in later moments of consciousness. These, then, are the incubations, the maturings, the elaborations of processes, — occurrences outside the pale of conscious thought, and nowhere else than in those inconceivably delicate structures that constitute the cerebral cortex. Dense as is our ignorance of the details of what happens here, we are certainly justified in assuming the existence of neural patterns which in the delicate cerebral tissue of the genius may form and dissolve and reform with kaleidoscopic swiftness and variety, with neurone contacts now here, now there, and with patterns which represent on the whole no mere copy of the original total excitation but rather those new settings and combinations between parts which underlie focalized association and which thus usher into consciousness, through plays of analogy, those arrivals which are the real inspirations of genius. Whether we have the madman or the genius depends upon the particular cerebral patterns that get formed. The mechanism of the matter in this particular is the same for both. We may conjecture that these rearrangements are due in part to the amœboid movements of the neurone processes or in part to the influences of nutrition and blood supply. That some change or other does actually take place is attested by what happens when we are acquiring some bit of skilled movement. Every one knows that improvement goes on in the intervals between practice, sometimes indeed to a surprising degree. The neural pattern has settled and grown into its modes in the absence of — and probably because of the absence of — all conscious effort.

That a cerebral rather than a psychical cause should be assigned to the uprushes, of whatever grade they may be,

is strongly indicated by the fact that *they are so predominantly and unmistakably dependent upon definitely assignable physical conditions*. Whatever increases the cerebral tensions, increases the arrivals in consciousness, — robust health, excitement, artificial stimulation in any form. Whatever, like fatigue or appropriate drugs, lowers the cerebral tensions leads to a stagnation of the conscious stream. We have only to recall Spencer, alternately writing a few pages of his psychology and engaging in a bout at tennis for the purpose of arousing his cerebral output.

The sense of being a mere *watcher* and *listener*, as unexpected arrivals invade consciousness, is by no means confined to the genius. Only this sense of the situation may be more fully impressed upon him owing to the more surprising character of the products that enter and pass before him.

An argument of much force can, it seems to me, be constructed against the advocates of subconscious elaboration by exhibiting the consequences of their assumption that the dream consciousness is one aspect of the secondary consciousness. If this is so, and if the secondary consciousness is the subterranean factory in which the toil and stress of mental elaboration are going forward, it would seem that the dream should occasionally be the theatre of such activity. But I cannot discover that this is ever the case. In dream speeches, in brilliant rejoinders to dream companions, in solutions of problems that have baffled the waking self, the dreamer is aware of no effort. He is the inert spectator, experiencing the dream, but taking no part in its progress. So far as I can see, the dream offers no whit of evidence of that elaborative travail in which the secondary consciousness is supposed to engage. The dilemma then is obvious. Either the

dream is not the partially revealed secondary consciousness, or the secondary consciousness is not wont to carry on those operations hypothetically attributed to it.

2. *Conversion.* — So similar are the claims advanced for the explanation of conversions and the phenomena of genius that after the foregoing discussion of the latter, a separate discussion of conversion may be dispensed with. The same claims of operations extraneous to consciousness, the same irresponsibility of results, is here alleged. The moment of conversion is but the bursting into flower of the energies long incubated subconsciously. The subliminal process has matured, and having reached its bursting point of tension, it rushes full fledged into consciousness.[1] As no new principle is involved, we may allow the previous section to apply alike to genius and to conversion.

d. The storehouse notion of subconsciousness.

It will be remembered that the storehouse phase of the hypothesis of subconsciousness was one of the earliest to be emphasized, arising as this hypothesis did in the interests of pathological phenomena. The disregarded sensations, corresponding to the various anæsthesias; the lost memories, evidenced by the more or less systematized amnesias; and lastly, the images assumed to be existent as controllers of the various automatisms; — all seemed to need a secondary consciousness to contain them. If the reader has been good enough to follow the matter thus far, he will have noted abundant indications of a tendency, on normal as well as on pathological grounds, to assume the necessity of a subconscious storehouse. James speaks definitely of the subliminal region as existing "for the accumulation of vestiges of sensible experience,"

[1] James, *Varieties of Religious Experience*, chap. ix, x, especially pp. 207, 209, 210, 236.

and again as "the abode of everything that is latent and the reservoir of everything that passes unrecorded or unobserved," containing "such things as all our momentarily inactive memories." Sidis repeatedly expresses the same idea. Indeed the expression "tapping the subconscious," a phrase used by all writers upon the topic, would be devoid of meaning did it not imply a belief that the region tapped was the depository of that which the so-called tapping brought to light.

Against this view we must at once raise the objection, outlined in the discussion of crystal vision, that psychical processes are evanescent affairs that cannot under any circumstances be *stored*. To try to store a psychical process would be like trying to retain the flame of a candle after the candle itself had been consumed. All that one can possibly mean by such storage is that the cerebral modifications are still existent as latent dispositions, ready again to function under adequate provocation.[1]

One would like to think that this is what the advocates of a secondary consciousness really believe, and that when they seem to state otherwise they are only speaking in figures. But such seems not to be the case. Dessoir's man, aroused from his reading by the mention of a familiar name, is entirely ignorant of the conversation that has gone on beside him. In hypnosis he can correctly report it all.[2] Janet's patient, Madame D., could recall no incident of an experience of being bitten by a dog and of being taken to Pasteur for treatment. All the events were recalled in hypnosis, and parts of them were muttered over in her sleep. Sidis's patient, Thomas Hanna, recalled his forgotten past in his dreams and in hypnoidal states. And to each one of these writers the

[1] Cf. Fullerton, *Metaphysics*, p. 494.
[2] Max Dessoir, *Das Doppel-Ich*. 1890.

fact that forgotten experiences can be revived in dreams and in hypnosis is avowedly and explicitly made to constitute a proof, not only that the hypnotic, the dream, and the secondary consciousnesses are continuous and identical manifestations, but also that the revived experiences have been present continuously in the keeping of the secondary consciousness, their presence being now revealed because for the moment this consciousness has become dominant under the conditions of the dream or of the hypnosis.[1] But by no legitimate process of scientific inference can one pass from the manifestations of dreams and hypnosis to the assumption that these same manifestations were the stored property of the secondary consciousness. All that one may legitimately infer is that the *conditions* for these manifestations were somewhere retained, — conditions that now make possible the fuller conscious experience of the dream or the hypnosis. And these conditions, we must once more insist, are cerebral and cerebral only. The dream and the hypnosis have introduced new conditions, and new conditions give new results. Because a strip of wood is at one moment saturated with steam to the point of pliability and at the next moment is bent, we have no warrant to assume from the second experience that it has been bent from the very start.

Thomas Hanna's past was restored to him by a final successful attempt at reviving the forgotten and splicing it on to the present. In this connection it is instructive to know that this coalescing was materially assisted, not only by such normal excitants as stimulating conversation and the theatre, but also by such physical stimulants as beer, coffee, and *cannabis indica*. It requires no argument, it seems to me, to establish the supposition that it was neu-

[1] The logically minded reader will have scented here an excellent instance of reasoning in a circle.

ral systems rather than severed consciousnesses that these excitants were efficacious in coalescing. Would any one think of claiming that the clearer and more inclusive memories of delirium and of drowning are to be explained as due to the resurrection of patches of consciousness which long since floated away from the main current and now return to be fused with it?

V. CONCLUSION. — SOME LOGICAL CONSIDERATIONS. — EXPLANATORY CONTINUITY VERSUS DESCRIPTIVE CONTINUITY

As incomplete as it is, the examination of evidence must terminate at the point reached in the foregoing section. Did space permit, it would be desirable to scrutinize much else that swells the pages of the writers that we have had under review. In particular, might we with profit inquire into the concept of "tapping," together with the method of "distraction" which forms its principal condition in hysterical cases; we might probe the psychological bases for those "denials" of the hysteric, — denials of sensation and of knowledge, — which a moment later are contradicted by the telltale revelations of automatic writing or by hypnotic confession; we might multiply instances of dire confusion between fact and inference, or point out the treacherous substitution of metaphors for sober descriptions, — metaphors which soon impose upon the users until the figure is taken for the fact, — or we might make merry over the promiscuous use of veritable Herbartian jargon; for into one or more of these latter infelicities have nearly all writers fallen in the struggle to portray with becoming fitness the underground conscious life which their lively fancies have constructed. But all this we must forego, turning at once to the final word. And this final word must be

devoted to the attempt to give in some measure a logical justification for what has preceded.

The reason why the doctrine of subconsciousness has made such an effective appeal, both to its projectors and to its subsequent adherents, is, I suppose, because it furnishes a way of discoursing about certain unusual phenomena so as to make them descriptively continuous with usual phenomena of the same or similar type. By assuming that the writing of the automatic hand is presided over by a secondary consciousness, or by supposing that the insights of the genius — types of mental process so often arrived at only after toil and anguish — are fashioned in the workshop of subconsciousness, it becomes possible to describe many extraordinary phenomena while yet using the ordinary terminology and preserving the habitual attitude of mind. Thus without inconvenience the new and unusual is descriptively assimilated with the old and usual. Similarly, since a scene or event which can be recalled is normally one that was originally received consciously, it is assumed that the vision of the dream or of the crystal, whenever it reveals some scene or event which happened in the presence of the individual though apparently unnoticed by him, must also have been *consciously* received, though the receiving consciousness be regarded as detached from the dominant mass.

These illustrations may be taken as typical of the kind of continuity which, it seems to me, has been too diligently courted. It is a *descriptive continuity* chiefly, — a continuity whose principal merit lies in its perpetuating, by easy use of analogy, the habitual and thus most comfortable way of envisaging the phenomena involved. Over against this variety of continuity we have endeavored to place what may be called an *explanatory continuity*, the unremitting aim of which is to refrain from introducing

new types of explanation in any series of similar phenomena, unless the series itself exhibit discontinuities sufficiently emphatic to demand a like discontinuity of interpretation. Thus we have endeavored to range automatic writings under the head of mechanically producible movements, and to view the inspirations of genius as identical in type with all processes that arrive in consciousness without direct external excitation.

The attempt to maintain a descriptive continuity in the matters with which we are here concerned has led to a fashion of speaking about the subconscious as if it were a completely demonstrated fact. And from speaking of it in this way, its advocates have come to regard it as unquestionably existent. But since the believers in the subconscious have then proceeded to use this for purposes of explanation, (*e. g.* of the phenomena of genius), the logical sin has been committed of endeavoring to explain the unknown by appeal to the unknowable. For a subconsciousness, by its very nature as submerged or detached, can never by any conceivable method be subjected to direct examination. If at any time it seems to be caught, it is no longer detached, but a part of the true consciousness of the moment. To use it, then, as an explanatory principle is to violate the rules of a scientifically sound method.

But the term "subconsciousness" may refer, not to a demonstrated entity, but to an hypothesis submitted for the explanation and interpretation of certain observed facts. However, as explanatory hypothesis in the mental sciences, it comes into immediate competition with an already well-established presupposition to the effect that mental processes, both in their arising and in their continuance, are somehow conditioned by cerebral activities and cerebral dispositions. And the problem confronting him who strives for explanatory continuity is whether he

shall assume a subconsciousness to account for various mental oddities which he encounters, or shall try to understand these latter by appealing to the same assumptions of cerebral disorder or cerebral peculiarity which have proved satisfactory enough in such cases as aphasic utterances or maniacal ravings. The principle of explanatory continuity demands that we push to its breaking point the psychophysical fashion of interpretation; for this is the explanation in terms of the known, or, if not that, of the conceivably knowable; whereas, as we have seen, the subconscious can be brought into the region of the known only by becoming something other than itself. It is with the entire conviction that the dictates of a logically demanded explanatory continuity require the consistent and thorough-going extension of the psychophysical point of view that the arguments of this paper are submitted to the reader's consideration.

A closing remark in the way of recommendation. Need is often felt for a compendious term to express the latent possibilities of mental life. To say of a recalcitrant word that it refuses to come from the subconscious would, in the meaning of many, be no more than to say that a latent possibility refused to actualize itself. And were the term "subconscious" not already overworked, it would be useful to reserve it for just this type of situation. "The subconscious" would then be "the not yet conscious" But "subconsciousness" seems to serve its most useful function in the sense of "marginal consciousness," the "not so conscious" of Mr. Lang's happy phrase. And it is the continued and exclusive use of the term in this sense that the present writer most heartily recommends. That use of the term which shall make it equivalent to "other consciousness" it has been the purpose of this paper to discourage.

XII

THE CAUSE OF A VOLUNTARY MOVEMENT

Robert Sessions Woodworth

The most mysterious and important fact of mental life is perhaps the power possessed by ideas to produce bodily movements, and through them to take a hand in the course of physical nature. Empirical psychology, to which the present paper aims to contribute, need not balk at the mystery of the connection of physical and psychical events, and need offer no further excuse than a practical convenience, amounting almost to necessity in the description of experimental results, for adopting interactionist terms, and frankly speaking of the mental cause of voluntary movement. The question to be attacked is: What exactly is the cause of such a movement? What is the "cue" that calls it out? What is the immediate conscious antecedent of the innervation of the muscles; or since there may be present in the complexity of a mental state various elements, some of which are possibly of no importance in the determination of the movement, what is the really effective factor in the consciousness immediately preceding a movement, that gives it its motor power?

A purely schematic psychology finds a ready answer to this question. Voluntary movement, it would say, is clearly movement that is foreseen and intended. There must therefore be in the mind an idea of the movement, and as such an idea could result only from previous experience of the movement, it will consist of reproduced sensations, sensations originally produced by the move-

ment. Therefore the cue of a voluntary movement consists of a sensorial image of the movement. Now among the sensations produced by a movement there are some, caused by the stimulation of the eye, ear, and other sense organs not located in the moving members, — such as are well called by James *remote* sensations, — which are not constant and invariable results of the movement. The eyes may be closed or turned away, the ears may be filled with the din of other things. The *resident* sensations on the contrary — those "muscular" and cutaneous sensations which originate in the moving member — are constant for a given movement. It is therefore these kinæsthetic sensations which give us direct and unequivocal knowledge of our movements, and it is the images of this sort of sensations which constitute the ideas of movement. To will a movement is to will the realization of such kinæsthetic ideas. The cue of a voluntary movement is a thought of how the movement is going to feel. The energizing of this kinæsthetic image by the exertion of an act of will may or may not be regarded as an additional necessity, according to the psychologist's general view regarding the essence of will. The idea of a movement must at any rate be there for the will to work on. The kinæsthetic image is the distinguishing mark, the determinant, of the coming movement.

Besides the logical consistency of this scheme, it has the advantage — if this be a genuine advantage — of making the effect appear like the cause. The motor effect is prefigured in the consciousness that gives rise to it, and voluntary movement is thus made to seem a process of realization of ideas. It is "natural" to suppose that if any idea is to have the power to produce a movement, it should be the idea of the movement. Accordingly we find that voluntary movement is ordinarily interpreted accord-

ing to this scheme. Some qualification is felt by most authors to be necessary, in the direction of diminishing the great importance assigned to kinæsthetic imagery. It is recognized that the thought of how the movement is going to feel cannot always be detected as present by introspection, and it is inferred that other ideas of a movement or of its results can be substituted, by association, for the kinæsthetic image; but the latter remains the typical and primitive cue to voluntary movement.

Among recent writers, this scheme of the mechanism of voluntary movement is perhaps most fully presented by William MacDougall, from whom the following quotations are made:[1]—

"The kind of idea that tends to issue most directly in action is the idea of a movement, the kinæsthetic idea."

"The process of voluntarily combining a number of simpler movements or positions of parts of the body into a novel more complex movement or attitude is well illustrated in the learning of many games, especially well perhaps in learning golf and rowing. The beginner on the golf-links 'addresses' the ball, coached by an expert. The expert commands a readjustment of this and that limb, of the trunk and head, until the proper attitude is struck, and it is the learner's task to combine the kinæsthetic impressions which this attitude yields to a single percept that can be produced on future occasions."

"Frequent repetition of such a series of movements under similar conditions results in their becoming what is called secondarily automatic; *i. e.* the person who frequently repeats such a series of movements, which, as we have seen, can only be acquired, and at first can only be executed, by direction of the attention to their kinæsthetic effects, becomes capable of executing them while his attention is otherwise occupied."

Few writers would go as far as MacDougall in the emphasis of kinæsthetic imagery. But then few have at-

[1] *Physiological Psychology*, 1905, pp. 163, 151, 152.

tempted so seriously to explain how ideas are connected with movement. He follows Munk and Bastian in regarding the motor area of the cortex as properly a sensory area, receiving kinæsthetic impressions. As this is, however the area from which most of the motor nerve fibres issue from the hemispheres, the almost inevitable conclusion was that kinæsthetic feelings are the last conscious process that can precede the motor innervation. Recent work in physiology tends to discredit the view of Munk and Bastian, and to show that the kinæsthetic area, though near the motor, is not identical with it. There is therefore no physiological necessity that kinæsthetic imagery should intervene between any idea and its motor effects.

Most authors content themselves with rather general statements concerning this matter. Wundt's formula is that voluntary movement, considered as a phenomenon of consciousness, "consists simply in the apperception of an idea of movement." [1] For Münsterberg an idea of the result to be gained is an essential factor in voluntary action, but the anticipating idea need by no means contain the same elements as the actual perception of the accomplished result. Abbreviating symbols, images from other senses, conceptual determinations can be substituted, provided only the same objective change is thought of.[2]

James, as is commonly the case, gives a description more faithful to the sum total of facts than other authors, and it is difficult to do justice to his teaching in a brief quotation like the following: [3] —

"*There can be no doubt whatever that the mental cue may be either an image of the resident or of the remote kind.* Although,

[1] *Grundzüge der Physiologischen Psychologie*, 5th ed., 1903, vol. ii, p. 307.

[2] *Grundzüge der Psychologie*, vol. i, p. 365.

[3] *Principles of Psychology*, 1890, vol. ii, pp. 518, 519. See further quotations in Dr. Burnett's paper, following this.

at the outset of our learning a movement, it would seem that the resident feelings must come strongly before consciousness, later this need not be the case. The rule, in fact, would seem to be that they tend to lapse more and more from consciousness, and that the more practiced we become in a movement, the more 'remote' do the ideas become which form its mental cue. What we are *interested* in is what sticks in our consciousness; everything else we get rid of as quickly as we can. Our resident feelings of movement have no substantive interest for us at all, as a rule. What interest us are the ends which the movement is to attain."

We find then in current psychological literature a broader and a narrower conception of the mechanism of voluntary movement. According to the narrower view, the mental content directly concerned in causing the movement is always a kinæsthetic image, a picture in "muscular" and perhaps also tactile terms of how the movement is going to feel; other ideas operate to cause movement only by first, through association, calling up the kinæsthetic image. The only qualification made is that the kinæsthetic imagery need not always come to the focus of consciousness, and that, with frequent repetition, it may decrease in obtrusiveness so as finally to be scarcely detectable by introspection. The broader conception is that any sort of image of the results to be gained by the movement may become associated with the movement and constitute its only cue. The kinæsthetic image is of special importance in the process of learning a new movement, or, more generally, whenever a movement is difficult of execution. Yet it has no special prerogative; any sort of image of the results of a movement may be as directly associated with movement, and have as inherent motive power, as the kinæsthetic idea.

The experimental observations which I am about to report have convinced me that neither the narrower nor

the broader of these conceptions is correct. The narrower conception is the more glaringly false: neither in the execution of a familiar movement nor in learning a new one is the kinæsthetic image of that movement entitled to rank as the sole direct excitant of the motor activity. But I am inclined to go further and deny that any form of sensorial image of the movement or of its outcome need be present in consciousness in the moment just preceding the innervation. Imagery, kinæsthetic, tactile, visual, auditory, may or may not be present at the launching of a voluntary movement; when present, it seems, in many persons, at least, to be incidental rather than essential to the process.

The material on which these statements are based consists of two sets of experiments, one on practice in gaining voluntary control of an unfamiliar movement, and one on the execution of a familiar movement. The practice experiments have already been reported, but will be referred to briefly below. The observations on the willing of familiar movements are purely introspective in nature, a fact which I regret as I recognize the rather treacherous character of unchecked introspection. Some of the pitfalls have probably been avoided by making the introspections under simple conditions, recording them at once, and having a considerable number of observers.

These experiments were simple in character. The "subject" was required to make a given movement with some preliminary hesitation, and to note the condition of mind that preceded the movement. He was to note particularly what imagery appeared; and in case of motor images he was asked to compare them with the sensations resulting immediately afterwards from the actual movement. Care was then taken to avoid as far as possible any confusion of centrally produced images with sensations of peripheral

origin. The movement was required to be hesitant, in the belief that imagery would thus be more apt to crop up; prompt movements were, however, also made, and were, in fact, preceded by less imagery than the hesitant movement. Some of the movements made, such as opening the mouth, wagging the jaw, winking, opening the closed eyes, flexing or separating the fingers, and flexing the foot, were "free" in the sense that motion was not communicated to any external object; in other cases, some instrument, such as scissors, forceps, or the dynamometer, was manipulated. Sometimes a choice of movements was allowed: the hand was to touch any part of the body; or it was to touch any object in the seen foreground; or the fingers were to be either flexed or extended; or a reaction to a sound was to be made with either hand or either foot.

The subjects were young adults, two women, and eleven men. All but one man and one woman were persons of considerable psychological training; the two exceptions were known, from previous tests, to possess good powers of introspective observation.

As might be expected, the subjects differed greatly in the sort and amount of imagery which they experienced. Some had motor images in advance of most of the movements tried; others had none. Some commonly had visual images, some never. Some had auditory images in preparation for speaking a word, some motor, some visual in addition to motor. Touch, pain, temperature, and semi-circular canal imagery cropped out occasionally. Verbal imagery, naming the act to be performed or the object to be moved or touched, was not infrequent. Some subjects did not anticipate movements in imagery of any sort, but attended to sensations of the initial position and of the beginning of the movement. Some subjects, in preparing to make a movement, actually made a start

or set the muscles in such a way as to be all ready to move, and the sensations of these incipient movements and preparatory adjustments were all they could detect of a sensorial nature prior to the movement. Scarcely any person had the same sort of imagery for all the movements studied. It may be well to introduce in outline the observations of the individual subjects; they are males except when it is otherwise stated.

1. Psychologist, who habitually has visual, auditory, and kinæsthetic imagery: No visual imagery appeared during these experiments; kinæsthetic imagery was the rule, and it constituted a fairly accurate and adequate premonition of the sensations that resulted a moment later from the actual movement. This subject has apparently more adequate motor imagery than any of the other persons examined; it was not completely adequate, however, as often the image represented a slow smooth movement, while the actual movement that ensued felt sudden or jerky; and there were other divergencies. In mentally preparing to squeeze a dynamometer, he had no kinæsthetic imagery, but pictured the cutaneous pressure and pain that would result from the movement. In reaction experiments, in which he has had much practice, he had little imagery of any sort.

2. Psychologist, with imagery of all kinds: the visual, auditory, and kinæsthetic being about on a par: No visual imagery came up spontaneously, even in manipulating external objects. Motor imagery appeared in most cases, but was usually vague and different from the actual sensations of the ensuing movement. It was often a feeling of the preliminary adjustment for the movement rather than of the movement in progress or of the final position, and may therefore have been a sense perception rather than a representation. In the case of a rather unfamiliar movement, however, there appeared a clear motor image, "even clearer than the actual sensations of the movement," and fairly adequate. In one or two cases there was no imagery that could be detected.

3. Psychologist; his strongest imagery is visual, then, in order, auditory, gustatory and olfactory, kinæsthetic: Visual

imagery was more common than motor, sometimes there was neither. In some cases where visual imagery might seem *a priori* to be most likely to occur, — as in manipulating a tool, — only kinæsthetic images were present; and in other cases, such as wagging the jaw, in which kinæsthetic imagery would be expected rather than visual, it was the visual that actually appeared.

4. Psychologist, strongly visual in type, in speech visual and kinæsthetic: Almost every sort of movement was presaged by visual imagery of the result of the movement. Even in wrestling, in which he is expert, he anticipates each move by a visual picture of the position into which he means to land his antagonist; sometimes a series of successive moves is thus visually pictured out beforehand. Similarly, in tennis, each stroke at the ball is preceded by a visual picture of the attempt of the opponent to return it. There was no motor imagery that could be certainly differentiated from sensations of the initial position and adjustment.

5. Woman, of no psychological training, with good visual and auditory imagery: There was no clear kinæsthetic imagery, except when a special effort was made to get it, and then the actual movement felt quite different from the anticipatory image. Frequently the sensations of the initial position or of the preliminary adjustment of the member, or of the external object to be moved were present instead of images. Visual imagery was sometimes present in preparing for a movement that was to affect external objects. Auditory imagery was the preliminary to speaking or singing. Verbal imagery, the name of the member or object concerned, or some statement such as "I am going to move it from here to there," was common. In many cases no imagery at all was detected.

6. Woman, psychologist, having in general very little imagery of any sort: Kinæsthetic imagery appeared in preparing to grip the dynamometer, but in no other instance. There was occasionally a visual image of the result; once there were tactile and temperature images. Usually little could be detected as preliminary to the movement except sensations of the present condition, a tingling or a tension in the part to be moved.

7. Psychologist, of pronounced visual type: On receiving directions to make a certain movement, he had a visual image of the movement or of some result; if the movement was held back for a little, this imagery cleared away and did not reappear just before actual movement. Once a cutaneous or kinæsthetic image appeared; sometimes no image at all appeared; sometimes sensations were all that could be detected.

8. Psychologist, possessing visual, kinæsthetic, auditory, and tactile imagery; the visual being most pronounced: Kinæsthetic imagery rarely appeared in anticipation of the movement, and when there it only partially resembled the feeling of the actual movement. A sort of spatial imagery, neither definitely visual nor definitely motor, was present in preparing to move a certain member or object. Verbal imagery occurred. Sensations of the preliminary condition were prominent.

9. Laboratory mechanic, with some experience as subject in psychological experiments, possessing visual, motor, and some auditory imagery: Visual imagery occurred at times; for instance, as he was hesitating about looking at a house a vivid image of the house appeared. Verbal imagery was somewhat more frequent; tactile and temperature imagery appeared in one experiment. In most cases, all that was noted was the sensations of the initial position or of a slight premature commencement of the movement.

10. Teacher of philosophy, with psychological training; of the auditory-motor type of imagery: Motor imagery occurred but rarely; visual somewhat more frequently. There was little of any kind throughout the experiments. Sensations from the part to be moved were the prominent content of consciousness.

11. Student of philosophy and psychology: He found it *possible* to picture the intended movement in either visual or kinæsthetic terms, rather more successfully in visual than in kinæsthetic, since the sensations of the movement when it was made were, to the subject, rather surprisingly different from the kinæsthetic anticipation. Except by effort directed to this end, he had neither visual nor kinæsthetic imagery of the movement about to be produced.

12. The writer, having little but auditory and a sort of spatial

imagery, which latter is neither distinctly visual nor distinctly motor: No kinæsthetic imagery of movements about to be made occurred except as the result of effort, and then it did not resemble the sensations of the movement when made; nor any visual except in one case; spatial more frequent; auditory present whenever there was any association between the movement and the production of sound. In preparing to make a movement, the subject's attention is directed to the sensations now coming from the part to be affected.

13. Psychologist, possessing little imagery, the auditory being most prominent: Imagery of any kind scarcely occurred at all except as the result of effort to get it. Kinæsthetic imagery so got was not like the sensations of the actual movement. The sensations of the preliminary condition of affairs were sometimes the object of attention.

My observations are not adapted to statistical treatment. The study does not purport to be a census, but a rough survey of the sorts of facts that occur. The different subjects did not make equal numbers of observations, nor was care taken to have the movements chosen a fair sample, statistically, of the voluntary motor activity of daily life. Hence no great importance is attached to the following figures: —

Out of 128 single introspections of the conscious preliminaries of voluntary movement: —

27 gave kinæsthetic imagery.
27 " visual imagery.
17 " imagery of other kinds.
30 " only peripheral sensations.
27 " an absence from the "field of attention" of all sensorial elements whether external impressions or images.

Some sort of imagery therefore occurred in 71 cases, or 55 %.

Kinæsthetic imagery occurred in 27 cases, or 21 %.

The kinæsthetic imagery was adequate in 11 cases, or 9 %.

Nearly one half of the cases showed no imagery; the kinæsthetic image was observed in only one fifth of the cases, and only half of these showed adequate images, *i. e.* images which were fair representations of the actual sensations of the movement. The inadequacy of the kinæsthetic image often consisted in insufficiency, as it did not represent the movement with any completeness; frequently, too, the image represented a much slower or smoother movement than the one which actually followed; occasionally the difference was the opposite of this. Quite generally, the sensations of the actual movement, when attended to, surprised the subject by their contrast with the anticipatory image. Familiar movements, such as opening the mouth, winking the eyes, or closing the fist, do not feel by any means as one imagines they will feel.

The adequacy or inadequacy of images is a point of importance in judging how much of a real causal function the image has in the production of movement. It has of course long been recognized that we have no image which conveys to our intelligence any conception of the neural and muscular mechanism by which the movement is executed; but it may be replied to this that the sensations of a movement could not be expected to teach anatomy; so long as they give an unequivocal sign of the movement, they furnish all that is required for recognizing it; and so long as the central reproduction of such sensations — the kinæsthetic image — gives an unequivocal sign of a given movement, it does enough to determine the movement. But when it is found that this kinæsthetic sign is neither unequivocal nor accurate, that it pictures a slow movement when a rapid one results, and in general that its contrast with the peripheral sensations

of actual movement is more in evidence than its resemblance to them, grave doubt begins to be thrown upon the view that the kinæsthetic image is the sufficient sign and cue of the movement. If we plan to make a certain movement, picturing to ourselves how it is going to feel, and then make it, we usually find that it does not feel as we had anticipated, and yet we know that we have made the movement we intended. Such a state of affairs would be impossible if the intention to make a certain movement were equivalent to the intention to make a movement which should feel like a certain kinæsthetic image. The kinæsthetic imagery of many and probably of nearly all persons is incapable of the minute gradations which those persons can introduce into their voluntary movements.[1] Adding to this the yet more significant fact that in most cases no kinæsthetic imagery is detected, I think it safe to conclude that the kinæsthetic image is not the exclusive, nor even the typical cue to voluntary movement. To insist that such an image "must be" there, although not observed, is mere schematism.

Leaving aside for the present the still more striking facts, derived from the introspective observations, that no imagery of any sort appears in a large share of the cases, and that where it does appear it is quite inadequate as a representation of the movement and of its results, I wish first to follow up the kinæsthetic image and adduce several further considerations that go to show its relative unimportance in the initiation of voluntary movement.

A distinction which needs making, and which when made clears matters up a good deal, is that between kinæsthetic *images* of movements about to be made and kinæsthetic and other resident *sensations* of the member

[1] Cf. Külpe's observations on the general lack of fine differences in imagery, *Grundriss der Psychologie*, 1893, pp. 186, 187.

that is about to move. Introspectively it is hard, at least at first, to distinguish between them. Some of my subjects noticed feelings of the member that was to move, feelings regarding which they could not be sure whether they were of central or peripheral origin. In some instances slight preliminary movements of the part actually occurred, as I observed by closely watching the subject. Other persons, on the other hand, were clear in their own minds that they were attending to actual sensations of the initial position or preliminary adjustment of the member.

The difficulty of distinguishing kinæsthetic images and sensations furnishes a clue to the explanation of the fact which is sometimes brought forward as a definite proof of the close relation between the idea of a movement, as cause, and the execution of the movement, as effect. It is said that we cannot picture a bodily movement without experiencing a strong impulse to make that movement. The following is a partial explanation. The introspective results have shown that it is perfectly possible to think of a movement — to identify it in thought — without experiencing any kinæsthetic image of it. Suppose that in such a case the effort is made to picture out how the movement will feel; the natural tendency is, since the movement is at our command, to make it and to find out how it feels. When the statement is made, "I cannot picture to myself the movement of my arm without making the movement, or at least starting to make it," the fact may be not the motor potency of the picture of the movement, but the inability to get the picture without making the movement. Some persons do, without doubt, have good powers of kinæsthetic imagery, but most persons seem to be rather deficient in it as compared with visual imagery: they scarcely need it, since they can al-

ways in simple cases supply the lack by making the actual movements. Most so-called motor imagery, as I am convinced by questioning those who report experiencing it, is spurious, consisting in reality of peripherally excited sensations of movement; and its much-vaunted motor efficacy I believe to be nothing more than the movements produced in the effort to get the feeling of a movement, by persons who are unable to arouse the image. In that close association between the feeling of a movement and the movement itself, which has been so much emphasized in arguing for the motor efficacy of kinæsthetic imagery, the movement is the cause and the supposed image the effect. The cause of the movement must be sought in quite a different quarter.

The most obdurate schematist would, I think, be convinced by gathering observations from a number of individuals that kinæsthetic images were not the invariable antecedent of voluntary movement, nor even the usual antecedent. He might, however, still be disposed to insist on their importance in the process of learning a new movement. The kinæsthetic image might be the natural antecedent of the movement, with which any other idea which was to issue in movement must first become associated. As the association became firmly fixed, and as attention was more and more directed to the remote consequences of the movement, the intermediate link in the chain of association might very probably cease to come clearly to consciousness. To determine whether the kinæsthetic image has this primordial importance, it is necessary to conduct experiments on the acquisition of control over unfamiliar movements.

The most important work in this direction is that of Bair,[1] who taught several persons to move their ears at

[1] *Psychological Review*, 1901, vol. viii, p. 474.

will; he recorded the movements by suitable apparatus, and at the same time determined as far as possible by what process the voluntary control was established. One important fact which he discovered was that familiarity with the feeling of the ear in motion, afforded by repeatedly exciting by electricity the muscle that moves it, was not of itself sufficient to give a person the power to make the movement at will. This familiarity is just what would be required according to the scheme outlined by MacDougall. It is true that the electrical excitation of the muscle was of some help, since persons who had this preliminary passive exercise learned the movement a little more rapidly than other persons; but this difference is sufficiently explained by the greater certainty with which such persons would recognize the right movement when by good luck they made it themselves in the midst of their unsuccessful attempts. A prompt recognition of success is a prime necessity in learning any performance. Bair also found that in the first stage of control over the ear movements other muscles contracted along with the muscle of the ear. Further practice was necessary to isolate the movement of the ear from the other movements with which it was associated. Success was not to be attained by voluntarily inhibiting the other movements; the thought of inhibiting them but caused them to occur with all the greater strength; what succeeded was the concentrating of attention on the ear, and dropping the other movements out of thought. The important point for our present purpose is that motion of a part followed thought of that part, — not necessarily thought of the movement of the part, since thought of preventing its motion was equally effective.

In similar though less extensive experiments which I made on myself, and which have already been reported,[1]

[1] *Le Mouvement*, 1903, p. 330.

the effect was made to isolate the extension and flexion of the great toe from that of the other toes. The establishment of complete voluntary control was a very gradual process. The first successes came by accident, as far as consciousness could tell. As in Bair's experiments, attention had to be concentrated on the one toe that was to be moved, since the thought of the others and the attempt to prevent their motion was a good means of insuring that they did move. I had in mind specially the question of kinæsthetic imagery, but was unable to detect any in the first successes or at all. Attention was directed to the toe itself, to the sensations arising in it, rather than to any mental image of its movement. It seems to be true that attention to the sensations coming from any member is one form of the cue of voluntary movement of the member. I infer from the results of Bair's, combined with my own, that even in first getting control over a particular movement, at least in the case of adults, the kinæsthetic image of that movement is neither a necessary nor a sufficient condition.

Observations on the imagery of young children first learning to control their movements are of necessity indirect, yet some suggestive facts have been established. The child is equipped by nature with a large store of definite reactions, defensive, locomotory, nutritional, vocal, ocular, facial, as well as with what seem more random movements of the arms and legs. These reactions necessarily occur first without the child's foreknowledge or intention; but having thus occurred they enter into the developing system of his thoughts and desires; they become associated with other things; and this is the process by which the child acquires control of his motor inheritance. The question is whether the first associations are formed between the movements and

the feelings and images of them, whether the child's first desire for a movement is the desire to feel it again.

Kirkpatrick[1] reports an instructive instance of a little girl who had not started to walk at the age of seventeen months. One day a pair of cuffs which her father had laid on a table interested her, and, creeping to the table, she pulled herself up by one of its legs, reached for a cuff with one hand, and put it on her other wrist, thus standing alone for the first time. Next she put on the other cuff, and after gazing for a moment in admiration at her new ornaments, walked across the room with an expression of great satisfaction on her face. When the cuffs were taken from her she would walk no more; to facilitate her progress, therefore, a pair was given her; she required them only a couple of days, at the end of which she walked at will. Trettien[2] has collected a number of similar instances in which children began to walk suddenly, making their first steps while their attention was completely absorbed by some interesting object, and entirely losing their balance if their attention was attracted to what they were doing. It must of course be admitted that these cases are exceptional in the suddenness with which the walking instinct blossomed out; when the process is more gradual, the child being perhaps worried along by his elders, it is hard to say what may be in his mind. But it is reasonably clear from the well-observed case of Kirkpatrick that kinæsthetic imagery is not always the first thing to be associated with movement. The little girl did not attend to the sensations of her movements; she was not engaged, as MacDougall puts it, in obtaining a unified percept of the complex kinæsthetic sensations which the walking aroused;

[1] *Psychological Review*, 1899, vol. vi, p. 275.

[2] *American Journal of Psychology*, 1900, vol. xi, p. 1.

her desire was not centred on feeling those sensations again; she did not first associate the movement with the thought of how it felt; she associated it with those cuffs. They were the original cue.

The baby kicking and throwing his arms around apparently derives pleasure from so doing, and it is hard to see what experience he can derive from the action except the resident sensations. But with the first appearance of definite control the centre of his interest passes elsewhere. About the first movement that he learns to perform at will is putting his hand in his mouth. Dexter observed carefully the progress made by an infant in acquiring control over this coördination. As he was throwing his arms in all directions, he accidentally put his hand into his mouth; he seemed to be pleased and to try to do it again. The next day he succeeded three times, and in a fortnight he had the movement completely under control. Now it is clearly impossible to suppose that the kinæsthetic impressions coming from the arm when it took the path to the mouth were so different from those caused by its other movements, and so much more pleasurable, as to be the cause for the selection of this particular movement. It was the sensations at the mouth that gave pleasure, and which, rather than the kinæsthetic sensations, became associated with the motor innervation. In general it is probably safe to say that when any particular one among the child's random movements of his arms and hands becomes of such interest as to be selected and reduced to voluntary control, the interest has arisen, not from any peculiarity in the kinæsthetic sensations of that movement, but from some other result. It is this result which attracts the child's attention and becomes the cue for the production of the movement.

[1] *Educational Review*, 1902, vol. xxiii, p. 81.

In the case of certain movements, there is what amounts to a demonstration, derived from brain physiology, that they result and always have resulted from visual or auditory and not from kinæsthetic cues. The clearest case is the movements of the eyeballs. These can be elicited, in experiments on the brains of monkeys, by excitation of three distinct portions of the cortex, the motor area, the visual area, and the auditory area. The visual area is that which is connected with the retina by sensory nerve fibres, and the destruction of which causes blindness in man or animals. The auditory area is connected with the ear, and its destruction causes deafness. Specialization exists within the visual area, each part of the field of view being represented in a particular spot within the area; and stimulation of this spot causes the eyes to turn toward the corresponding part of the field of view so as to bring it into distinct vision. This motor action of the visual cortex is thus that by which we turn our eyes to look at any object seen in indirect vision. It might still be thought that the visual area acted on the eye muscles through the medium of a kinæsthetic area and of the motor area, were it not for abundant evidence, both anatomical and physiological, that the eye movements elicited by stimulation of the visual cortex are quite independent of the motor area. Anatomically, it is known that descending fibres connect the visual area with the anterior corpora quadrigemina, the coördinating centre for eye movements, and physiologically it is found that[1] the same movements of the eye are aroused by stimulation of the visual area, even after the motor area has been destroyed. Thus it is certain that turning the eyes to look at anything is the direct result of visual stimulation, and not,

[1] E. A. Schäfer, *International Monthly Journal of Anatomy and Physiology*, 1888, vol. v; *Text Book of Physiology*, 1900, vol. ii, p. 751.

even at first, dependent upon a kinæsthetic intermediary. The same line of reasoning applies equally to the turning of the eyes towards a source of sound, since it is found that this movement occurs on stimulation of the auditory area, even after the motor and visual areas are destroyed. The turning of the head, too, which is apt to accompany turning of the eyes in response to either visual or auditory stimulation, results directly from the excitation of the visual and auditory areas, without the motor area, and without the possibility of a kinæsthetic intermediary.

Control over the vocal organs is probably acquired normally through hearing. No such close physiological reasoning is possible here as in relation to eye movements, but we have at least the fact that a child understands spoken words before he begins to talk, showing that speech is primarily an auditory matter with him; and we have the further fact that he readily imitates spoken sounds, showing a close and organized connection between the "word-hearing centre" and the motor speech centre.

Having thus attempted to show that in special cases the voluntary control over bodily movements is not acquired by means of kinæsthetic imagery, I wish now to bring forward two general considerations of great importance in deciding on the rôle played by the kinæsthetic image both in the acquisition and in the familiar execution of voluntary movement.

The first consideration harks back to the distinction drawn between the kinæsthetic sensations representing the present condition of the member about to be moved, and the kinæsthetic image of the impending movement. The latter is probably of very little functional importance, but the kinæsthetic sensations are extremely important. Their importance is shown by the results that follow

when they are lacking. Loss of coördination and sometimes even inability or unwillingness to move the anæsthetic member are the results. This is abundantly shown both by physiological experiments on animals and by observations on pathological loss of sensation in man. The sensations of the initial position of a member are an essential factor in determining its movements, since the movement will differ according to the initial position. The same sensory stimulus that arouses flexion when a limb is extended may arouse extension when it is flexed. The sensations coming in from the member as it moves are also an essential factor in coördinating the further progress of the movement. If they are lacking the result may be a wavering motion, as seen in monkeys whose limbs have been rendered anæsthetic by cutting the sensory nerve fibres;[1] an excess of motion as seen in locomotor ataxia;[2] or a deficiency of motion, a premature stopping, as seen in hysterical anæsthesia.[3] The kinæsthetic sensations on which the coördination of movement so largely depends need not indeed come to the focus of attention; their effects are in large measure reflex, yet they may become the object of attention in deliberately preparing for a movement.

The resident sensations of a member at rest in any position are a factor in determining its movement out of that position; the kinæsthetic sensations of a member in motion are a factor in determining the further progress or the arrest of the movement. In walking, the sensa-

[1] Sherrington, *Proceedings of the Royal Society of London*, 1895, vol. lvii, p. 481.

[2] H. E. Hering, *Archiv für experimentelle Pathologie und Pharmakologie*, 1897, vol. xxxviii, p. 278.

[3] Gley and Marillier, *Revue philosophique*, 1887, vol. xxiii, p. 441. Cremer, *Ueber das Schätzen von Distanzen bei Bewegung von Arm und Hand*, Würzburg, 1887, p. 33.

tions of the right leg's step are a factor in eliciting the ensuing step of the left leg; in alternately flexing and extending the forearm, the sensations of flexion are a factor in calling out the ensuing extension, and the sensations of extension help to elicit the following flexion; in breathing, the sensations of inspiration cause expiration and the sensations of expiration cause inspiration. Why should not the corresponding images have the same motor tendencies? But this is just the opposite of what is claimed for them. The image of flexion is supposed to cause flexion, not extension. The image of an inspiratory movement is supposed to cause an inspiratory movement, whereas the corresponding sensation causes expiration. The image of a step with the right foot is supposed to cause that foot to step, instead of the other. The image of the beginning of a movement is supposed to cause the beginning of the movement, instead of causing a later stage in the movement, as the corresponding sensation would do; and the image of the later part of the movement is supposed to cause that later part to occur, whereas the corresponding sensation would cause the movement to stop. It is impossible that the sensation of any movement or part of a movement should act directly to cause a repetition of the same movement or part; for no such repetition can occur until another and a contrary movement has intervened.

It is certainly unreasonable to assign to an image a motor effect contrary to that exerted by the sensation which it reproduces or represents. As the sensation of a given movement can never have been the motor cue to a repetition of that movement, but always to some other movement, it is hardly conceivable that the image should have the power assigned to it of calling out the movement which it represents. If, on the other hand, the im-

age has a motor tendency like that of the corresponding sensation, it is of no consequence whatever; for since the image would represent the member in a situation differing from its actual one and would call for a movement out of that unreal situation, it would be calling for a movement that could not be executed at the moment. My conclusion is that genuine motor imagery, so far as it occurs, has very little motor effect.

Although the preceding facts and considerations, if they are accepted as valid, dispose effectually of the scheme which assigns an essential rôle to the kinæsthetic image in the initiation of voluntary movement, yet in order to state the case completely, there is still another general fact that must be adduced. The fact is somewhat over-stated by saying that there is no such thing as voluntary bodily movement. The emphasis is on *bodily*. There is such a thing, but it is a rarity, seldom occurring in practical life. Instances of it are found in "free" gymnastics, in the tricks children love to play with their fingers, and in such movements as psychologists make when they are exemplifying to themselves the process of voluntary movement. In these cases the bodily movement is willed for its own sake; there is no resulting motion of external things. Even here the interest seldom lies in the resident sensations, it is more apt to be centred in the visual appearance of the movement. But the great majority of purposive movements are executed for the sake of some effect they produce beyond the mere movement. Sometimes the desired effect is the removal of an unpleasant cutaneous sensation or the production of some other intra-bodily change, but most often it is the movement of an external object, or of the body in relation to an external object. It would be much truer to speak of our voluntary movement of physical objects than

to speak of voluntary bodily movements. If I wish to cut a stick, my intention is not that of making certain back and forth movements of my arm, while simultaneously holding the fingers pressed tightly towards each other; my intention is to cut that stick. When I voluntarily start to walk, my intention is not that of alternately moving my legs in a certain manner; my will is directed towards reaching a certain place. I am unable to describe with any approach to accuracy what movements my arms or legs are to make; but I am able to state exactly what result I design to accomplish. It may conceivably be different with the infant, but this is not probable. It is not likely that he first acquires control over his movements, which he then applies in manipulating objects, so that at a certain stage of his development he would know what movements of his limbs he wished to execute, but not what changes in objects were to be accomplished thereby. His movements become organized with reference to situations and to definite things as the focal points of situations; instinct itself, with which he starts, is so organized; his motor development is a process of getting control of the things around him rather than of learning and applying his own possibilities in the way of bodily movement. It would be impossible to account for his motor performances without reference to the size, shape, weight, distance and direction of the things he deals with. Both by instinct and by the force of experience, his movements are coördinated with reference to these properties of physical objects. It is not so much a "supply of ideas of the various movements that are possible" as a knowledge of the various effects that can be produced, that is "the first prerequisite of the voluntary life."[1]

The kinæsthetic image must be given up, as the special

[1] Cf. James, *Principles of Psychology*, vol. ii, p. 488.

and invariable, or the usual, or even as a possible cue of voluntary movement. That it is not the invariable or usual cue is simply the observed fact; that it can hardly provide either the direct causal antecedent of the represented movement or the means by which movements are identified and associated, is indicated in the first case by the contradiction which would ensue between the function of the image and that of the kinæsthetic sensations of which it is the image; and in the second case by our fundamental tendency to perceive and conceive movements as changes affected in things rather than as mere motions of the body and limbs.

So far, our discussion would seem to land us in some such position as the following. Not indeed the kinæsthetic image, but *some* image representing the result of a movement, is the mental cue of voluntary action. The image may be visual, auditory, tactile, or belong to any sense whatever; so long as it represents the end to be reached, it may come, by associations formed during the production of the movement, to have the power of putting the movement into play.

Unfortunately, the facts reported near the beginning of this paper drive us at once from this second position. In a large proportion of cases, no image whatever could be detected by my subjects as occurring in anticipation of a movement. Individuals differ, some having visual images frequently, if not regularly, as they are preparing to move, and some seldom having images of any kind. Where imagery is lacking, peripheral sensations are sometimes present in the field of attention, but after these cases are subtracted, there still remain a good share of the whole number — about one fifth in my observations — in which no sensorial content could be detected.

The first reaction of a psychologist to the statement of this result is apt to take the form of insisting that there clearly must have been present some image of the movement or of its result, otherwise the movement was not voluntary, since it could not have been foreshadowed in consciousness. How could a particular movement be determined upon, unless there was present some image representing and identifying the movement? In spite of the feeling that there "must be" an image present, it is worth while finding out whether there actually is always one there. There is not. The only escape from this conclusion is by assuming careless introspection on the part of my subjects; but most of them were trained in introspection. In my own case, I am perfectly certain that no sensorial image appears in anticipation of most of my movements. I have tried again and again to detect it, and it is seldom that I can find any. How is a man who has almost none but auditory imagery to obtain images of most of his movements? Speech movements, when hesitant, writing movements, always, are with me preceded by auditory imagery of the words, letters, or syllables about to be produced; the movements of the fingers on the piano, if hesitant, are preceded by auditory images of the notes to be struck; drumming with the fingers on a table is accompanied by imaged notes, which however do not precede the finger movements, but are timed to synchronize with them as if the fingers were making the sounds. In most other movements, there is no imagery. If I open a penknife I have no preliminary imagery of the feeling of opening it or of its appearance with the blade open. If I start to walk into the next room, I have no preliminary feeling of a rhythmical motion of my legs, nor preliminary vision of the next room. I do have in some cases what was called in the individual reports above

a sort of spatial imagery, if it may be called imagery, which has no definite sensory character: in planning to go to another room or building, or to move an object, I think of their position with reference to my body and feel that I could look or point toward them. Such being my own experience, I am inclined to give entire credence to the statements of my subjects, when they report no image of the desired result to be present as a preliminary to movement. "Of course," they sometimes said, "I know what I am going to do, but I have no visual, nor auditory, nor motor, nor tactile, nor olfactory, nor gustatory image of it." This may be "impossible" from a certain psychological point of view, but it is certainly a fact.

There follow a number of instances from the reports of the subjects mentioned earlier in the paper, instances in which the image either was absent, or presented certain peculiarities that need to be considered in forming a conception of the function of the image in voluntary movement. It should, perhaps, be definitely stated that no suggestion was made to the subjects, other than that implied in my asking them to describe the condition of mind that immediately preceded the voluntary movement, and particularly to note the kinæsthetic and other images present.

Subject 1. The condition preparatory to opening the eyes was described as "absolutely blank."

The subject was required to select, at a preparatory signal, which hand or foot he would move in reacting to an immediately following sound, and afterward was asked to describe the imagery present at the time of decision. In four cases he reported images of different sorts, in two other cases he reported: "I determined to react with the right foot, that was all;" "blank, automatic."

Subject 2. The condition preparatory to gripping the dynamometer with all his force was thus described: on the first and second trials, "I do not know what was there;" after repeated

trials, "The only feeling that I was able to pick out was a feeling of flexion of the fingers and hand, tactile and motor in character. There is a sort of feeling of vacancy of the arm, a lack of anything that was definite; an 'all over' readiness is about all I can call it."

Subject 3. Preparatory to winking the eye: "No image."

Bending the finger at the first joint only: "I just have the idea of bending the finger; it is hard to tell of what the image consists."

Hitting at a mark on the blackboard with a piece of chalk: "It is hard to analyze. One element that stands out is the visual image of seeing myself hit it, the picture of the hand as it will be when it reaches the mark. The actual appearance of the mark is present only in the background of consciousness, being taken for granted. Just at the moment when the act is set off, the mind seems to be practically blank."

Subject 4. Opening the mouth: "It 's a pretty hard thing to say." After several trials: "It seems to me that I have a very vague image of my mouth as it would look, when open, in a mirror; that is when I try to get an image, but I don't know that I ever noticed it before."

Subject 5. Moving either forefinger, at will, to the nose: "I was not thinking of the nose, nor of anything much. I had a sort of feeling that the hand chosen had to do something, a feeling of getting ready in the hand. There was no visual nor kinæsthetic image of the movement."

Subject 6. Hitting at a dot on paper with a pencil: "I am more interested in the objective dot than in anything in myself."

Subject 7. Opening the mouth widely: "On hearing the words 'open the mouth,' I had a distinct image of a peculiar clogging sensation near the ear that occurs when the mouth is open widely. Just before opening the mouth, there is not a single distinct thing."

Wagging the jaw from side to side: "As soon as the words were spoken, I had a beautiful visual image, but in preparing to do it myself, I did not get anything."

Gripping the dynamometer: After the first trial, "There was

nothing that could be detected. I was so much interested in getting the strongest possible contraction that I did not notice the image;" after the second trial, "Sensations from the scalp;" after the third trial, "Sensations from the region of the diaphragm, representing a preliminary stage in the process;" after further trials, "First of all, I have mixed and vague visual images, before actually getting to business. This is some seconds before the movement. Then the whole thing disappears, and there is nothing left that I can discover, except the complex of feelings which result from the motor process itself."

Subject 8. Reacting to sound by a movement of either hand or of either foot, the choice being made at a preparatory signal: On reacting with the left hand, "I am perfectly certain of this, that I thought of the position of the hand as being to the left of me, that is, I did when I chose this hand to move, not when I moved; when the sound came, I was so prepared for that particular movement that it went off of itself."

Subject 9. Flexing the foot: "I don't know how it feels beforehand. When I think of doing it, the parts seem all of a tremble ready to do it."

Picking up a small object with a pair of forceps: "It is hard to notice anything, except that you naturally have the impulse to squeeze the thing and to lift it."

Subject 10. Opening the closed eyes: "I can detect no change at all in consciousness until the movement takes place. I was thinking neither of the objects that were about to be seen nor of the feeling of the eyes. I did think of the objects in front during the time that my eyes were closed, but not just at the moment of willing to open them."

Gripping the dynamometer, the subject's first experience with this instrument: On the first trial, "A visual image of the hand moving, the thumb going over toward the finger;" on repetition, "I cannot detect anything; the first change I feel is the movement itself."

Touching with the right forefinger any spot on the surface of the body, the spot to be selected by the subject: "I find it a little complex. In deliberating which of the knees to touch, I had visual images of them both, but at the moment of determi-

nation, I could not have told from consciousness what I was going to do. There was nothing in consciousness that determined the selection. I find I can pass the hand from one point to another without having any image of the part to be touched; nor am I conscious of sensations coming from the part in advance of the movement. Visual images are usually present, but do not seem to intensify just before the movement, nor do they disappear with the execution of the movement."

Touching the nose with either forefinger at the subject's choice: "If a visual image of either hand comes suddenly to mind, I tend to move that hand; but if I inhibit the movement at the moment, the image continues, and no change in it seems to occur immediately preceding the movement."

Subject 11. Opening a pair of scissors: "I can detect no visual image of the scissors opening, nor any kinæsthetic image of the thumb and finger; yet I am perfectly conscious of what I want to do; a notion of the whole thing to be accomplished seems to be felt in the ends of the scissor blades."

Moving a small object from one place to another: "When I make an effort to do so, I can picture myself moving it, but it requires an effort to do this, and the image is not at all like the natural feeling of anticipation. There is no visual image of the object in the place to which it is to be moved."

Gripping the dynamometer: "There is no preliminary feeling of tension, and no observable kinæsthetic or visual image."

Subject 12. This subject's observations have been partly outlined above, in the main text. In the experiments with choice, his attention was directed to the sensations of the member to be moved, when the choice was between members, and to the point to be reached, when the choice was between points. In touching objects before him while the eyes were shut, the attention was directed to the points in space where the objects were situated ("spatial imagery").

Subject 13. Opening the mouth: "I could not detect any preliminary imagery."

Wagging the jaw at a signal: "I had a visual image of the movement beforehand, but when the signal came, it seemed as if there was nothing in mind except that the movement occurred."

Should it be attempted to destroy the force of these negative instances by arguing that an image may after all have been present in consciousness, but not in the field of attention, it is hard, of course, to disprove such an assumption, but if true it does not remove the difficulty that confronts us. The intention to do a particular act may be clearly attended to without any image lying in the field of attention; the image cannot, therefore, be the identifying mark of the act towards which attention is directed.

It might also be suggested that verbal imagery supplied the place of other forms in persons who lack the latter. Verbal imagery does indeed sometimes, perhaps often, appear, but in some persons, at least, is very often absent. Verbal imagery would suffer from inadequacy, since we can make many movements and do many things, which we cannot designate unequivocally in words. In the instances in which verbal imagery was reported by my subjects, it was sometimes ludicrously inadequate as a distinguishing mark of the movement that was thought of. "I am going to move the thing from here to there" might apply to a thousand movements; the words cannot possibly have been the determinant of the particular movement made.

The same criticism on the score of inadequacy can be applied to other than verbal imagery. Earlier in this paper it was applied to many instances of kinæsthetic imagery; most of these, in the light of further criticisms, seemed likely not to be images but sensations, and should therefore be added to the other cases in which no image was present.

This question of the adequacy or inadequacy of the image, when one is present, demands careful attention if we are seriously looking for a mental cue which shall be

the real cause or determinant of the movement. Not that it is fondly hoped to discover in the cause any inner necessity of the effect; but at least the cause must unequivocally identify its particular effect. I intend to do a certain act; my intention is particularized; if whatever imagery may be present is less particular than my intention and than the act which results, then the image is not the adequate cue of the act.

Sensations are indeed always present as contributory factors in determining the act. They represent the existing situation with reference to which the act is performed, and the act is determined by the existing situation as well as by the intention. The intention, broadly speaking, includes the present situation as its background, but the focus of the intention is the thought of the change which it is desired to effect in the situation. In particular, the kinæsthetic sensations of the present position of the member to be moved are contributing factors in determining the movement, though they are not usually in the field of attention. Qualified in this way, our criterion of adequacy will be that the image of an act to be accomplished, added to the sensations which represent the existing situation, must be definite enough to determine the movement which is intended. To recur a moment to the case of verbal imagery: If with my eyes open I say "I will move this object from here to there," sensations serve to particularize the general terms "this object," "here," and "there," so that what is intended is adequately represented by the verbal imagery plus the sensations. If now I close my eyes, and execute again the same act, accompanied by the same verbal imagery, I need something more to particularize the general terms. If I have no visual, kinæsthetic, or tactile image to add to my verbal imagery, the intention remains unparticularized by sensorial contents.

Visual imagery must be of a high order of definiteness — of a higher order than most persons lay claim to — in order to serve as the specifying agent in determining the act. No doubt some persons possess visual imagery sufficiently faithful in details to portray exactly what the act is to be, or at least — which is all that adequacy requires — to distinguish it from all other acts that can be distinguished in intention and execution. In such persons, and in such cases as their visual image attains this degree of definiteness, it seems capable of functioning as the adequate cue of the act; but in other cases not. And these other cases, apparently, form the great majority of voluntary acts.

The visual image is open to yet further suspicion; for not all of the essential features of an act can be portrayed in visual terms. The force to be exerted by the movement cannot be so portrayed. Adequacy, as above defined, does not indeed require that all the details of the act shall be represented, but only enough to distinguish the result attained from all others that might have been intended and successfully achieved. But there is often if not always implicit in the result as desired a certain degree of ease or difficulty of performance. The intention to lift a heavy object differs from that of lifting a light one. To represent this, kinæsthetic imagery would be required, but is not usually present.

In aiming to produce a good tone on the violin or in singing, a high grade of auditory imagery would be required to represent unequivocally the desired result. A man may know that he has succeeded in such attempts without having been able beforehand to get an adequate auditory image of the tone aimed at. To represent unequivocally all the results that a man is able to accomplish at will would require imagery belonging to various senses, and each of a high grade of definiteness. Not

many persons, it is safe to say, can adequately image all the ends which they strive for and attain.

The instance of speech is here very much in point. One who has vivid auditory imagery, in voluntarily preparing to utter a certain word, is apt to hear the word internally with sufficient definiteness to distinguish it from all other words. But persons of other types of imagery do not testify to such an experience.[1] Some of them say that they feel the word in their throat, — probably another instance of actual movement, rather than of genuine kinæsthetic imagery,[2] — and others that they see either the whole word or some part of it. In many such cases the image is not definite enough to identify the word. A person may know what he is going to say without having any adequate image of it. Even the person of good auditory imagery, though he mentally hears the word he is about to say when his intention is definitely to speak that word, does not have a stream of auditory imagery running along ahead of his spoken words in connected discourse. Here it would be right to say of the spoken words, as was said before of movements of the arms and legs, that it is not they that are voluntary, but some result which they serve to bring about, in this case the expression of a thought. Can an adequate sensorial image be formed of a judgment or of a concept — an image that shall unequivocally identify that particular thought among all other thoughts that the individual is capable of expressing? A positive answer would certainly not be maintained without difficulty.

[1] Compare a study of the imagery of silent reading by W. B. Secor, in *American Journal of Psychology*, 1900, vol. xi, pp. 225–236.

[2] Compare the demonstrations of actual articulation, during silent speech, by Hansen and Lehman, *Philosophische Studien*, 1895, vol. xi, pp. 471–530; and by H. S. Curtis, *American Journal of Psychology*, 1900, vol. xi, pp. 237–239; also by Secor, *op. cit.*

Even the thought of a physical object is not commonly reducible to sensorial terms. The size of an object, for example, is not judged simply by its present appearance, but very largely by reference to previous experience of objects; yet no image of the previous experiences is ordinarily present in consciousness during the act of judging the size of an object. Brain physiology affords no support to the view that all mental contents must be sensorial in character. Only a small part of the cortex is sensory in function. The great "association areas," though their functions are not made out in detail, are certainly not sensory or motor. It is quite true that sensorial content is more obtrusive and has more "body" than perceptual or conceptual content, and also is more easily describable to other persons; yet not all the contents of consciousness are sensorial. When I, a poor visualizer, run over a list of names of my former students and try to recall each individual, identifying this one and that one, hesitating over a name and finally saying, "Yes, that was the man, I recall him now," — in all this there is scarcely a trace of visual imagery, and though as a means of bringing the absent before me and getting a feeling of their nearness the experience would be quite unsatisfactory, yet its lack of clear imagery does not make it vague in the least; it supplies information which can be utilized in writing to the individual, and even in recognizing and naming him on sight. All this is very much in line with the insistence by James in "The Stream of Thought" on the importance of non-sensorial elements in consciousness — feelings of relation, of tendency, and of meaning. James treats these non-sensorial states as "transitive," not as possible resting points for thought, and here his view is capable of extension; for if a thing is not fully represented nor even identified by the image of it, while yet

the thought is focused on the thing, the image is not the substantive element in the thought. As regards the real point and definition of the thought, the image is, in many cases at least, a by-product. Appearing in some persons and not in others, who all alike, nevertheless, think of the thing with equal definiteness and act in the same way and with the same particularization of intention towards it, the image cannot be taken as the real object of thought.

From this point of view, it is not specially mysterious that the sensorial image should often be absent from the state of mind preparatory to voluntary action. The cue of the act is the thought, not the image. The most definite feature of the thought is the cause of the definiteness of the act. If it be allowed that there is much mental content that is not reducible to sensorial imagery, and that some of this content usually lies at the focus of attention, constituting the real point and meaning of the thought, no reason remains for supposing that there "must be" a sensorial image of the act which shall function as the cue of the movement.

Brief mention should be made of a subject lying beyond the scope of this inquiry which has already been experimentally worked out and has yielded a result exactly parallel to that reached here. The two results fortify each other, and together form a better basis for a positive theory than either alone would afford. The processes of *recognition* and of *comparison* used formerly to be described by a scheme similar to that of the mechanism of voluntary movement that was sketched at the beginning of this paper. Recognition was supposed to result from the emergence of a memory image of some past experience of the recognized object. Comparison of a past with a present sensation was supposed to result from the persistence or recurrence of an image of the

past sensation, which could mentally be placed side by side with the present sensation, and their likeness or difference read off. Külpe[1] opened a new line of thought by insisting that though some recognitions and comparisons might be of this type, which he called "mediate," there was another type, the "immediate," in which no image of the earlier experience emerged. Here again, psychologists were inclined to object that there "must be" an image, otherwise there would be no basis for recognition or comparison. Experimental observations, however, have abundantly shown that both processes often occur without making use of memory images.[2] Images do often appear, but *after* the recognition more often than before it, and when the comparison is hesitating and uncertain, rather than when it is prompt and sure. Here, as in the case of voluntary movement, imagery seems to be a by-product, an epiphenomenon, rather than a causal factor in the process.[3]

The discussion so far has led us to two negations: we have rejected first the kinæsthetic image, and second any image at all, as the adequate determinant of voluntary movement. But there is still a third and more radical negation to which we are forced by the introspective evidence. Not only is the image inadequate, but the very thought, the field of attention just prior to the movement, is often inadequate as a distinguishing mark of the move-

[1] *Grundriss der Psychologie*, 1893, pp. 177, 212.

[2] Gamble and Calkins, *Zeitschrift für Psychologie, etc.*, 1903, vol. xxxii, pp. 177–199; vol. xxxiii, pp. 161–170. Schumann, *Ibid.* 1898, vol. xvii, p. 119; 1902, vol. xxx, pp. 241, 321. Whipple, *American Journal of Psychology*, 1901, vol. xii, pp. 409–457; 1902, vol. xiii, pp. 219–268. Bentley, *Ibid.* 1899, vol. xi. pp. 1–48.

[3] Cf. James, *Principles*, vol. i, p. 472, "The image, *per se*, the nucleus, is *functionally* the least important part of the thought."

ment. It would not serve to identify the act among all the acts that can be intended and executed. The intention is not always present, and is seldom fully present, in the field of attention at the moment just preceding the innervation of the movement.

If we refer again to our introspective results, we find that the state of mind just preceding the movement was described in some cases as almost blank. A clear consciousness of the act to be performed had been present just before, but as the act was delayed, the consciousness was reduced to a feeling of readiness, until something happened to actualize the movement that was already determined and prepared. One person thus described the consciousness preparatory to hitting at a mark: the thought of the mark quickly retreated to the background of consciousness, and was thereafter "taken for granted;" next the thought of the hand hitting the mark came to the focus of attention, but in its turn retreated, having a rather blank condition of simple readiness. Another subject reported that in moving the hand to any one, at will, of a number of objects, the thought of the chosen object was uppermost in mind just preceding the movement, the hand being taken for granted; if, on the contrary, the object was constant but either hand selected at will, attention was directed to the hand, the object being taken for granted. Such cases show that the whole determination of an act need not take place in one act of attention, and that the act may still remain determined, though attention to it has waned. In short the nervous system may become set or adjusted for a certain act, and remain so for a time without the continuance of clear consciousness of the act; or the system may be so set as partially to determine the act, the complete determination being effected in a subsequent mo-

ment. This is probably always the case to a large extent. The whole situation, as far as it is known, results in a certain adjustment of the nervous system, so that, for example, acts that would be performed while we are alone are not performed or thought of in public. Each sort of situation produces a corresponding set of the nervous system, and is thus a partial determinant of all the acts that are performed within that situation.

The conception of a *set* or *adjustment*, or temporary "disposition" of the nervous system is founded not only on facts like the preceding, but on more minute and exact information regarding nervous action. We know that nervous pathways differ in their conductivity, some offering more resistance to the passage of nerve currents than others, and all being subject to influences which alter their resistance from one moment to another, and thus alter the direction which shall be taken by the nerve currents and the mental and motor result. One of the influences which decreases the resistance of a nerve pathway is previous activity of that pathway: repeated activity gives rise to a permanent lowering of the resistance and thus to a habit. Aside from permanent sets of this sort, immediately preceding activity of a given pathway induces a temporary reduction of the resistance, a temporary set, which makes it easier to do a thing a second time just after it has once been done. There are still other ways of producing a temporary set within the nervous system: on account of the convergence of different pathways, a current coming from one source may facilitate the passage, and reinforce the effect, of a current coming from quite another part of the system; or, on the contrary, one current may set a pathway against another, so as to inhibit its effect.

There are thus good physiological grounds for assert-

ing that activity of any part of the nervous system holds over for a while and produces a temporary set having a definite tendency; and that the activities of various parts may converge upon a single point in the system and produce a joint result. A movement is thus in part previously determined and may also be the joint product of several partial determinants. When a man confronted by a novel situation observes this and that feature of it in turn, each new perception leaves behind in the nervous system a temporary adjustment to the feature observed, until the whole situation becomes — not clearly mirrored in any one moment of his consciousness — but dynamically represented by the sum or resultant of these partial adjustments. If he then thinks of some change that he can make in the situation and decides to make it, the definiteness of his intention is not contained wholly in the field of attention at that moment, but depends upon the total neural set and so on the total situation. The intention to act adds a new partial adjustment to the existing sum of adjustments. If the execution of the act is suspended, the set of the system persists for a time, or, if it dissolves, may be reconstituted without repetition of the gradual process by which it was first made, and very little fresh consciousness is needed to put the act into effect.

The complete determinant of a voluntary motor act — that which specifies exactly what act it shall be — is nothing less than the total set of the nervous system at the moment. The set is determined partly by factors of long standing, instincts and habits, partly by the sensations of the moment, partly by recent perceptions of the situation and by other thoughts lately present in consciousness; at the moment, however, these factors, though they contribute essentially to the set of the system, are for the

most part present in consciousness only as a background or "fringe" if at all, while the attention is occupied by the thought of some particular change to be effected in the situation. The thought may be clothed in sensorial images, — rags and tatters, or gorgeous raiment, — but these are after all only clothes, and a naked thought can perfectly well perform its function of starting the motor machinery in action and determining the point and object of its application.

XIII

AN EXPERIMENTAL TEST OF THE CLASSICAL THEORY OF VOLITION

Charles Theodore Burnett

Psychology has been trying to push forward on a theory of the nature of voluntary action that is well set forth in the following sentences from James: —

"A supply of ideas of the various movements that are possible left in the memory by experiences of their involuntary performance is thus the first prerequisite of the voluntary life" (Psychology, vol. ii, p. 488).

"An anticipatory image, then, of the sensorial consequences of a movement, plus (on certain occasions) the fiat that these consequences shall become actual, is the only psychic state which introspection lets us discern as the forerunner of our voluntary acts" (p. 501).

"There can be no doubt whatever that the mental cue may be either an image of the resident or of the remote kind. . . . The rule, in fact, would seem to be that they (resident feelings) tend to lapse more and more from consciousness, and that the more practiced we become in a movement, the more 'remote' do the ideas become which form its mental cue. What we are interested in is what sticks in our consciousness. . . . What interest us are the ends which the movement is to attain. Such an end is generally an outer impression on the eye or ear, or sometimes on the skin, nose, or palate" (pp. 518–519).

Thorndike urges on the contrary (Elements of Psychology, p. 282), that "really any mental state whatever may

be the antecedent of an intentional act." The context indicates that "antecedent" is used here in the sense of "causal antecedent," so far as this term is applicable in psychology.

A satisfactory way of testing the truth of the classical theory as set forth by James appears to lie in a comparison between the anticipatory idea of some movement and the actual execution of that movement. If a movement could be found that should be under complete voluntary control while yet one could form no idea of it, either of the resident or remote type, the theory would seem to break down. I chose for comparison actual and imagined voluntary movements of the back-and-forth type executed at maximum rates. A sample of all such movements is found in the wagging of a finger.

The experiments that I go on to report continue a general inquiry into the psychophysics of the motor impulse that I began in a former paper (Psych. Rev. vol. xi, p. 370), where I presented the results of my study of certain motor illusions arising through the really or apparently abnormal position of certain limbs.

1. The apparatus and method of the experiments were of the simplest. Fixed limits were arranged between which the limbs or the moving parts were made to execute their arcs of real movement. The rate was measured by a metronome. In the first series of experiments, the results of which are stated in Table I, the rate of imagined movement was determined first and not sufficient care was taken to make the arcs of imagined movement correspond to those of the later real movement. In the second series greater care was taken in this respect, and the actual movements were executed first, that the standard for the imagined movement might be clearly in mind.

Metronome-rate and movement-rate were regarded as

equal to each other when the movement-rate in question could be maintained for eight or ten complete back-and-forth movements. The angles to which the several arcs corresponded were approximately as follows: forefinger, 23°, hand, 11°, forearm, 5°, whole arm, 5°, leg, 9°, eyes, 15°. Only the right limbs were used. During the imagination of whole-arm and leg movements these members were allowed to hang free. The arm movement was made with stiff elbow, and that of the leg was made from the hip and with stiff knee. Between the different experiments in a given series with a given limb there was always a lapse of at least an hour and a half, nearly always a lapse of several hours, and not infrequently one of days. The type of imagination employed in the experiments of Table I was kinæsthetic. I was both experimenter and observer, hence the results must be regarded as tentative.

TABLE I.[1]

(Ten experiments with each movement of both series.)

		Finger		Hand		Forearm		Whole Arm		Leg	
		Actual	Imagined	Actual	Imagined	Actual	Imagined	Actual	Imagined	Actual	Imagined
First Series	Average	364.8	128.6	433.6	132.4	435.2	137.4	350.4	133.2	196.	118.2
	Av. var.	16.64	10.72	21.12	12.4	23.04	12.32	24.	9.44	21.6	11.88
Second Series	Average	384.	155.4	508.8	166.8	500.8	161.6	390.4	155.2	237.6	140.4
	Av. var.	12.8	16.64	43.2	21.76	18.88	23.04	26.	27.84	21.12	20.48

First Series.

Av. var. among the different kinds of actual movements = 66.24
" " " imagined " = 5.24
Av. of av. var. of all the actual movements = 21.28
" " imagined " = 11.35

Second Series.

Av. var. among the different kinds of actual movements = 80.18
" " " imagined " = 8.86
Av. of av. var. of all the actual movements = 24.4
" " imagined " = 21.95

[1] Rate per minute is indicated in all tables.

2. The following facts appear in Table I: —

a. The movements in question can be executed much more rapidly than they can be imagined.

b. With practice they increase in rate in both the real and the imaginary forms.

c. The per cent of this increase is somewhat greater for imagined movements in all cases except that of the leg.

d. The variability of rate for any given movement is greater for actual movements as a whole than for imagined movements as a whole, very markedly so in the first series.

e. The variation in rate from each other among the different kinds of movements is in both series ten times as great for the actual as for the imagined. (Cf. footnotes to Table I.)

f. The average of all the rates of imagined movement is less than the lowest rate of actual movement in the corresponding series. (First series, 130; second series, 155.9.)

g. The following conclusions about underlying causes may be drawn from these facts: (1) It appears from *e* that the rate of imagined movement is not determined by differences in the limbs. (2) It appears from *a* that the motor cue for the actual movement cannot be the imagination of that movement in kinæsthetic terms.

3. I next raise the question whether visual imagination is able to furnish the motor cue; and I present in answer Table II.

4. The following facts appear: —

a. The rate of imagined movement shows a very large increase, surpassing in two cases (finger and leg) the corresponding actual movement given in the second series of Table I; but falling well below in the other movements of the same series.

TABLE II. — VISUAL TYPE OF IMAGINATION.

(Ten experiments with each movement.)

	Finger	Hand	Forearm	Whole Arm	Leg
Average	422.4	448.8	432.	342.4	248.4
Av. var.	10.24	29.92	32.	64.	32.56

Av. var. among the different kinds of movements = 66.72
Av. of av. var. of all the movements = 33.74

b. The variability of each visually imagined movement is greater in every case than that of the kinæsthetically imagined movement, with the single exception of the finger; and it surpasses, for forearm, whole arm, and leg, the variability of the corresponding actual movements.

c. The average variation among the several kinds of imagined movements is greatly increased over both series of Table I.

d. The following conclusions may be drawn from these facts: (1) It appears from *a* that the rate of visually imagined movement is not rapid enough to serve in all cases as motor cue for the actual movement. (2) It appears from *b* that the complex of causes determining the maximum rate of visually imagined movement is much more fluctuating than is that determining the maximum rate of the kinæsthetic variety. (3) It appears from *c* that visual imagination does not act as evenly among the several movements as does kinæsthetic.

5. Can we, then, find any field wherein the maximum rate of imagined back-and-forth movement is great enough to equal the maximum rate of actual voluntary movement? So far as my experiments cover this point, their results are presented in Table III.

Some words of explanation are required here. The criticism of method for the first series of Table I applies to

the eye-movements in the first series of this table. The choice of fields was determined in part by the report of introspection as to secondary mental processes occurring at the time when the primary process of imagining was going on.

TABLE III.

(Ten experiments with each movement in both series.)

		Eye		Breathing			Syllables		Touch	Rap
		Actual	Imagined	Actual [1]	Imagined Sound [1]	Imagined Movement	Actual	Imagined Sound	Imagined	Imagined Sound
First Series	Average	136.8	90.	366.4	332.8	146.	514.4	479.2	98.	154.8
	Av. var.	4.96	6.	19.92	40.08	9.2	21.12	24.8	9.6	30.32
Second Series	Average	142.6	104.4							
	Av. var.	4.88	10.72							

The amplitude of chest-movement was very small, due to the very endeavor to execute the movement at a maximum rate. I have no objective measure of it, though it was definite enough in feeling to be reproducible in imagination with apparently considerable exactness. It proved to be very difficult, not to say impossible, to distinguish between a series of actual breathing-movements built up out of the sounds made by the breath, as it was being rapidly exhaled and inhaled, and such a series made out of the kinæsthetic and cutaneous sensations occurring on the occasion of the physical process. So for the actual breathing series I let the composition out of auditory elements suffice. Unit sound for the purpose of determining the rate was double, *i. e.* composed of the

[1] Since the unit here is the double sound made by inhalation and exhalation, the number of single sounds produced and imagined is twice the number indicated.

two sounds of inhaled and exhaled breath. The actual movement was thus of the usual back-and-forth type. In imagining the series here, I could and did distinguish between a kinæsthetic and an auditory variety.

The syllables used were tut-tut-tut, and so on, continued indefinitely. Of course every time this syllable was uttered the end of the tongue made a back-and-forth movement comparable to those of the limbs. When the movement was actually made, the syllable was not vocalized, but whispered; and jaw-movements were allowed, as these seemed to increase the ease of execution.

The eye-movements were made through an angle of approximately 15°. The fixation lines between which the movements were made, were two upright joists in the wall opposite the subject. Unit movement was of the usual back-and-forth type. In imagining this movement, I held my hand pressed lightly over the eyeballs, that I might know and exclude cases where actual eye-movement should occur. The imagination of this movement was in kinæsthetic terms.

The sort of alternating touches imagined were those with which I had become familiar in the actual finger-movements, viz., the impressions made on the volar and dorsal sides of the finger by contact with the fixed limits of the movement-arc. Unit touch for determination of the rate in this movement was itself double, made up of a volar and a dorsal touch imagined in alternation.

The sound chosen to represent those occurring independently of bodily activities was the sharp rap of a pencil on the bare table. Here each sound constituted the unit.

6. The following facts appear in Table III : —

a. Wherever actual and imagined movements may be properly compared because involving units of like com-

plexity, the maximum rate of the actual surpasses the maximum rate of the imagined.

b. In no case is the rate of the imagined movement large enough to equal the highest rate of actual movement that has been found in the course of these experiments.

c. The maximum rate of the imagined sound of breathing surpasses those of all the imagined movements studied except the first four in Table II, where visual imagination was concerned. This comparison seems to be fair, since the auditory unit here is double, just as is the unit in the other cases. The rate given for the imagined auditory syllables must be halved to make it comparable.

d. Introspection shows that the auditory — and I may add here the visual — movements have the character of *continuous impressions*, like the scream of a whistle, while the imagination of muscular movements is typically that of *alternating impressions*.

e. With regard to the main problem, we are forced to the negative conclusion that so far there is no evidence that we have in imagination any adequate motor cue for voluntary back-and-forth movements, such as is required by the classical theory of volition.

7. How does the size of the imagined movement-angle affect the rate? I attempted to answer this by comparing the rate of an imagined movement whose angle was the largest which the member in question was capable of making, with that of the movements of the corresponding limbs previously recorded. The results appear in Table IV.

8. These facts are shown by this Table: —

a. The amplitude of the arc is an important factor in determining the maximum rate of imagined movement. This is indicated by the marked decrease in rate of comparison with Table I.

b. While the size of the maximum arc in the several kinds of movement is not the same, yet the causes operative in lessening the rate act approximately alike throughout the series; and so it appears that the amount of variation in size of arc for the several kinds is not here an important factor.

TABLE IV. — ANGLE OF IMAGINED MOVEMENT A MAXIMUM — KINÆSTHETIC TYPE OF IMAGINATION.

(Ten experiments with each movement.)

	Finger	Hand	Forearm	Whole Arm	Leg
Average	75.8	65.2	53.2	46.7	52.4
Av. var.	11.4	7.56	9.96	6.44	5.04

Av. var. among the different kinds of movements = 9.48
Av. of av. var. of all the movements = 8.08

c. Since the average variation from each other of the several imagined movements is even less in Table I than in Table IV, and is, when taken absolutely, of small amount, it appears that the several angles of movement chosen for the former experiments did not differ importantly in size.

The results of the foregoing experiments seem to indicate that in the limited field under consideration, that of voluntary movements of the back-and-forth type, the imagination of neither resident sensations from the limbs nor of remote sensations as from the eye, ear, or skin, showing how the moving part looks or sounds or feels, can furnish an adequate cue for the occurrence of actual movements at a maximum rate. The protests of Thorndike and of others against the classical theory of volition seem in so far to be justified.

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